The IRON AGE

The National Metalworking Weekly

Post-Strike Survey:

The

STEEL SUPPLY

Outlook See P.35

Markets for Metalworking: A New Series P.39

Draw Forming Bends Tough Parts Easily P.75

Digest of the Week P-2



HOSKINS Chromel-Alume

THERMOCOUPLE ALLOYS

CONSIDER for a moment the significance of the statement made above and what it means to users of Hoskins Chromel-Alumel thermocouple alloys the world over. For example, take "The Case of the Ageless Alumel" . . .

Not long ago, an industrial concern in Japan "discovered" 265 pounds of 8-gauge wire hidden away in a remote corner of their plant. Its Inspection Tag, still intact, identified it as being Hoskins Alumel that had been purchased over 20 years ago. How it had escaped being used during all those years no one knew. Inasmuch as it was still in good usable condition, however, the company wrote to inquire if it would be practical . . . or indeed even possible to have a similar quantity of 8-gauge Chromel-P wire specially processed so that its millivoltage would match that of the 1933-vintage Alumel. Imagine their surprise when they were advised that all Chromel-P alloy is specially processed by Hoskins to a uniform standard of quality, and that . . . "regardless of when produced or where purchased, any length of genuine Chromel-P wire can be joined to any length of

genuine Alumel to form a thermocouple which will register true temperature-emf values within the close specified limits of Hoskins Accuracy Guarantee."

No wonder, then, that Chromel-Alumel thermocouples are the world's basic standard of accuracy for the measurement of high temperatures. No wonder that the words "Chromel-Alumel" are recognized as ... "trade names you can trust!"

If you use thermocouples, this new manual is meant for you! It contains complete specifications on Chromel-Alumel alloys, lists temperature-millivolt equivalents, explains standardization procedures, gives much useful application data. And it's yours for the asking without obligation. Send for your free copy today!



Chromel-Alumel thermocouple alloys are produced exclusively by

HOSKINS MANUFACTURING COMPANY

4445 LAWTON AVENUE . DETROIT 8, MICHIGAN

How to save money with special sections

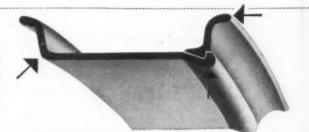
REDUCE YOUR MACHINING COSTS

You can eliminate excess metal by using a special section rolled to your drawings. This often makes rough machining unnecessary. Result: fewer production steps, less scrap, less steel to buy. For example, a manufacturer formerly had to machine away about 17 pct of a small flat bar in making an electric typewriter carriage rail. This precision-rolled special section completely eliminated the machining operations and the resulting metal wastage.



GET STRENGTH WHERE IT'S NEEDED

With special sections your designers can provide extra metal for strength, yet eliminate excess metal for lightness and economy. Tire rims and side rings for automobiles, trucks, buses and heavy equipment are designed with extra steel at points of stress.



USE PRE-FORMED BLANKS FOR COLD FORMING

Various cold-forming techniques are increasing in popularity because they result in fast, economical production, and in better physical properties. Special sections make ideal cold-forming blanks. This automobile trunk latch part is produced from special section blanks, the critical bulb being pre-formed by hot-rolling, and subsequently cold-shaped in a continuous closed die.



USE BAR LENGTHS INSTEAD OF INDIVIDUAL BLANKS

Special sections make ideal screw machine stock. As in the case of this universal joint trunnion bearing, the bar shape reduces machining and scrap. So, if you have a product that can be produced economically on screw machines, look for additional savings by using special sections as bar stock.



GET FREEDOM OF DESIGN

Surprisingly complex shapes—these window sash sections, for example—can be hot-rolled to your drawings and specifications. A single rolled shape often replaces an entire fabrication, and is stronger, more durable, neater in appearance.



NOW, before you re-design your product or order new stocks of steel, we urge you to look into the many advantages of hot-rolled special sections. We'd be happy to give you full details. Please contact the Bethlehem sales office nearest you.

BETHLEHEM STEED COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL



Aug. 9, 1956-Vol. 178, No. 6

The IRON AGE

Digest of the Week in Metalworking

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NEWS DEVELOPMENTS

SECOND QUARTER EARNINGS ESTABLISHED RECORDS

With good first half recorded, strike over and demand up it looks like '56 will be a banner year. Big Three and other producers hit new highs in earnings and sales. Order backlogs are running very high.

CONVEYOR INDUSTRY ENTERS

NEW MARKETS P. 39

Many new companies are entering the conveyor field, and a few are venturing into previously untrod territory.



But the majority are too busy filling requirements for automation market. Sales this year might top \$1 billion mark.

HOW 84TH CONGRESS

TREATED BUSINESS

Ike got about half of his program adopted. Defense spending, mammoth highway program are big factors to metalworking. Government's role as a major market continues. Business fared comparatively well despite Democratic majority.

HIGH STATE TAXES DRIVE **OUT INDUSTRY**

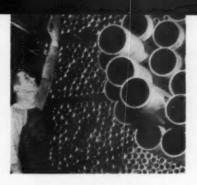
P. 40

Pennsylvania's highest in the nation bite on corporations holds back state's industrial expansion. Studies are now under way to revise state's tax structure. Governor Leader appoints committee to draw up a financial plan for the state. Tax revision is overdue.

Address mail to The IRON AGE

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STEEL STRIKE OVER, BUT MEM-ORY LINGERS. Although the steel strike has ended, serious problems confront consumers. The worst is yet to come. An Iron Age survey points up weak and strong points in the steel market outlook. Metalworking came through strike relatively unscathed, but inventories were hit hard. P. 35.

STAINLESS 201 FINDS NEW AUTOMOTIVE USE P. 43

Stainless may have made an important breakthrough in automotive field. Use of type 201 in piston expander-spacers has been accepted by one major auto producer. It's important to stainless as a step in use in functional parts in auto industry.

FEATURE ARTICLES

RADIAL DRAW FORMING BENDS TOUGH ALLOYS EASILY P. 75

How do you fabricate lightweight, high-strength alloys at minimum cost? One good way is to make them in one piece, so accurately that you need no subsequent machining or hand fitting. Universal machines prove helpful, permit practically any type of contouring on sheet, extrusions, rolled sections.

HUMANICS: LIBERAL DOSES CURE PRODUCTION ILLS P. 80

More men, money and machines. That's a standard (and expensive) formula for boosting production. A much less costly way is to encourage your regular work force to get more out of existing equipment. Here's a blueprint of how Bell Aircraft Corp. applied the art of humanics to virtually double helicopter production.

ZINC-RICH PAINT: FOR PROBLEM SURFACES

An anti-corrosive paint, high in zinc content, adheres firmly even to mill-scaled steel. Yet it can be applied like conventional paints by brush, dip or spray methods. It also adheres well to tough-to-paint galvanized surfaces. Metal content of the dry film runs as high as 95 pct. No special cleaning's required—just brush away loose rust and scale before applying.

P. 82

HOW CARBON CONTENT AFFECTS IMPACT PROPERTIES P. 85

Few metallurgical topics are more important than impact fracture. Heattreated, low alloy steels—despite other engineering advantages—are not immune to this type of failure. Carbon and alloy content are crucial factors in determining impact properties. This comprehensive report relates these factors to eight commonly-used low alloy steels.

SPOTWELD CABINETS FAST WITH 4-IN-1 SETUP P. 90

Four automatic spotwelding units functioning as a coordinated team can make short work of production joining. Toledo Desk & Fixture, using such an electronically controlled arrangement, weld-fabricates 400 steel kitchen cabinets hourly, using four men. Formerly, 18 men turned out 140 per hour.

MARKETS AND PRICES

ALUMINIUM'S TOP MAN TELLS THE IRON AGE P. 44

Nathanael V. Davis, president of world's second largest primary aluminum producer, tells, in an exclusive interview, what is in store for Canadian aluminum production. Gives company's thinking on current, future outlook.

HOW HIGH WILL 1957 AUTO PRICES GO?

this year.

It's the main subject of discussion these days in Detroit. Higher steel prices are bound to have an effect but that's only part of the answer. Next year's market will be quite a contrast to new and used car situations earlier

P. 52

P. 57

P. 123

RISING PRICES HAVE WHITE HOUSE WORRIED

Election year makes it necessary to keep signs of inflation from getting out of hand. Both parties are well aware that "synthetic" prosperity may result. Washington uses legal and persuasive methods.

WHAT'S BEHIND FARWEST'S ELECTRONICS BOOM?

Presence of engineering talent and skilled labor, as well as availability of research firms, enables West Coast equipment makers to pick up steam. With a new plant a day opening, more competition with Eastern plants is a sure bet.

TIGHT STEEL MARKET LIES AHEAD

It will take five to six months for metalworking to recover from the strike. Steel procurement will be tight well into 1957. Plate and structural consumers will still be coming up for air in second quarter.

NEXT WEEK:

PRODUCT DIVERSIFICATION CAN BE REWARDING

A management expert, Richard W. Dalzell, takes you through the shoals and pitfalls on the road to successful product diversification. As Mr. Dalzell points out, the pot at the end of the rainbow can hold ashes as well as gold—if you're not careful.





TAKES LESS SPACE THAN PICKLING AT EMPIRE STEEL

descales carbon strip at 250' per minute; slashes acid tank requirements 75 %

A 16-wheel Wheelabrator mechanical descaling machine at Empire Steel Corporation in Mansfield, Ohio, cleans 250' of carbon strip a minute and has eliminated all pickling except a 13-second immersion in a tank only 60' long. The Wheelabrator is 66' long and does cleaning that would require 250' of tanks for straight pickling. This eliminates 75% of acid re-

quirements and reduces acid disposal problems and tank maintenance. In addition, the matte finish imparted by Wheelabrating enhances the cold working properties of the metal. The high cleaning capacity of Wheelabrator equipment in a relatively small area means savings in floor space for new lines and permits increase in capacity of existing lines in the floor space presently available.

For more information on Wheelabrator blast descaling principles and savings, send today for Bulletin 864.





behind the name

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AS foundrymen know, it takes experience—sound, resourceful engineering—to develop new machines and methods for lower-cost production.

Working closely with the industry for 50 years, Osborn offers a full line of experience-engineered foundry equipment.

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QUALITY MANUFACTURE—Osborn craftsmen are experienced in manufacturing foundry machines that assure dependable performance . . . day after day.



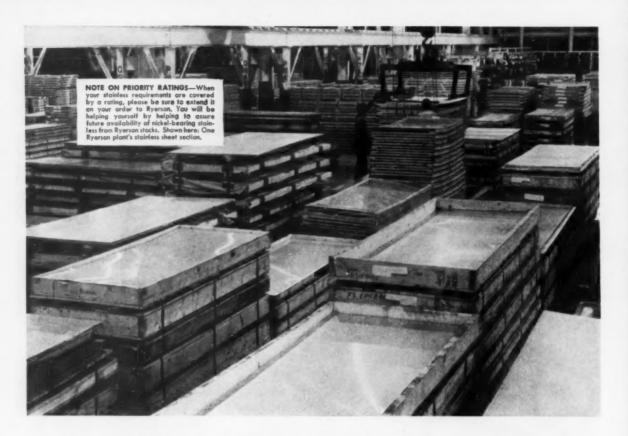
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for STAINLESS, call Ryerson...



Ryerson stainless bar stocks include free-cutting types, aircraft quality bars—many others.



Any shape can be accurately flame cut from stainless plate with special Ryerson plate burning equipment.



More than 300 miles of stainless pipe and tubing are on hand at Ryerson. Size range: 1/4" through 81/4" O.D.



Felt pads on Ryerson shears protect the beautiful finish and flatness of Allegheny stainless sheets during cutting.

here's why: your call to Ryerson connects you with the nation's largest stocks of stainless steel—2,351 sizes, shapes, types and finishes of time-tested Allegheny stainless—carried in tonnages that assure prompt shipment of your warehouse requirements.

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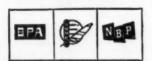
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EDITORIAL

Was the Steel Strike a Phony?

 SOME ARM-CHAIR labor and management generals say the steel strike was a phony. The boys in the cloak room say the whole thing was a setup; that it was cut and dried long before the first steel furnace tapped out.

Some people who cried for blood and "a holding of the line" are saying the industry was a pushover. It is hinted that once again the steel leaders lacked guts in their fight.

Other "authorities" claim that the strike was slated to go for about a month. This, it was said, would allow inventory to shrink, thus supporting higher prices which were to go into effect after the

This talk is not a figment of the imagination; it actually exists. It comes from people who should have more sense. No one in his right mind would accuse any steel leader of having made a secret pact with Dave McDonald which would be covered up later by a "show" of fight and eventually a strike.

Perhaps the negotiations left something to be desired. But they were negotiations. The industry would have held out until Labor Day had there not been irresistible pressure from the Administration.

It is inconsistent to urge the steel industry to stand firm for a principle, then later accuse it of shamming when it takes a costly strike. There was a difference of opinion among some steel people about how far to go in dealing with the union. But that was normal for the industry. Steel firms did blow their horn loudly at first that they would go so far and no further. That also is nothing unusual in serious negotiations.

The union showed no signs of being party to a sham or windowdressing strike. Dave McDonald was all set to go well into September if necessary to get what he wanted. The pressure put on him by a cabinet official was similar to that put on industry by another such administration officer.

The only thing its critics can blame the industry for is that it fought for a principle, and lost—at least partially. This is the fifth time it has done this.

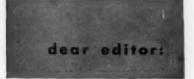
That is hardly in the realm of being phony.

Tom Campbell

EDITOR-IN-CHIEF

THERE'S NO LIMIT TO Design





letters from readers

1

Tests For Foremen

Sir:

The article on p. 34 of your July 5 issue, "Foremen: There's Room for Improvement," has evoked considerable interest on our part. We wonder whether or not you have some sort of standard questionnaire which might be used in testing foremen. E. A. White, Wasley Products, Plainville, Conn.

I suggest you write Mr. Harry B. Clayton, Executive Vice President, John A. Patton Management Engineers, Inc., 180 W. Adams Street, Chicago 3, Illinois. He has worked with the testing battery described in The Iron Age story, and can give you suggestions as to administering the testing.

Similarly, I suggest you contact Miss Frances Murray, Manager, Industrial Division, Science Research Associates, 57 W. Grand Ave., Chicago, Illinoins. This firm, which markets a number of industrial tests, will forward their catalogue along with specific recommendations for testing foremen in your particular job situation.—Ed.

Wants To Use Ti

Sir:

Enjoyed very much your article "Will Titanium Ever Go Commercial?" A possible use for titanium suggested itself to us while reading it.

We use a variety of tools in our alloying furnaces including rakes, skimmers, stirring paddles, etc. In the past we have had trouble with these tools due to their deforming from the heat. We are investigating the use of higher temperature steels in these tools, but also want to look into the possibilities of titanium metal. The relative lightness of titanium, not to mention the higher strength and resistance to heat, would make working the furnaces easier on the men.

Our alloy metal temperatures sometimes reach a maximum of 1550°F., but usually operate around

1300°F. F. E. Kleyle, Kaiser Aluminum & Chemical Corp., Chalmette, La.

Although your proposed application has some merit, we're atraid titanium will not be suitable in the operating temperature ranges suggested.

When repeatedly heated to 1300°F for extended periods, titanium will tend to pick up quantities of carbon, oxygen, nitrogen, or hydrogen—depending upon the nature of the surrounding atmosphere. This contamination results in damaging embrittlement and destroys the usefulness of the material.

—Ed.

Plating Dollar

Sir.

Your article, entitled "How to Get More for Your Plating Dollar," is very interesting and I'm sure will be very helpful in solving our future plating problems. If still available, we would appreciate very much receiving two extra copies of this article. L. E. Barner, Sr., Mechanical Engr., Bendix Aviation Corp., York Div., York, Pa.



Automatic Barrel Plating

Sir:

Please send me two copies of your special feature No. 5 entitled "Plating and Metal Cleaning and Finishing Handbook."

These special features are very interesting and well prepared. I certainly hope that you continue them. W. M. Hollingsworth, Purchasing Director, Geo. D. Roper Corp., Rockford, Ill.



I'M A TOUGH BUYER

BUT GARRETT'S GOT IT FOR QUALITY

No sir, you can't beat Garrett when it comes to top quality in small parts. Their "statistical quality control system" means every shipment you get is the finest. But quality is only part of what I like about Garrett. They manufacture and stock the world's most complete line of washers and hose clamps. Boy, when you need any kind of a lock washer, flat washer, spring washer or hose clamp you get it fast . . . most everything right out of stock.

When it comes to stampings and assemblies that's where their high-speed automatic equipment stars. Turns out exactly what you want in no time at all.

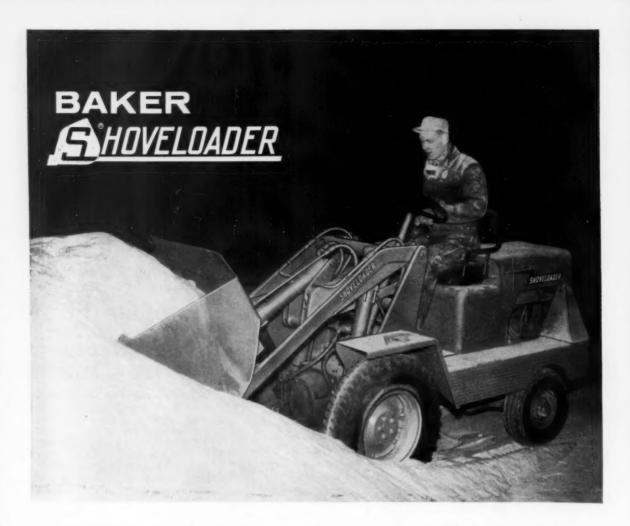
Sure, I'm a tough buyer. I want the best. I want it fast. I want it priced right. And Garrett is the place for me.

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...mechanizes your bulk handling for less per day than the cost of a laborer with a hand shovel

Baker Shoveloader costs around \$400 less than comparable machines—enables you to mechanize bulk material handling for about \$10 per day—less than the pay of a laborer with a hand shovel.

Designed for continuous heavy work, Shoveloader takes a 12 cubic foot bite weighing up to 1500 pounds. Four forward speeds with top speed of 14 mph make this a fast machine and insure better operation on ramps and rough ground.

And don't forget safety when you compare. The operator is behind the lift arms and has a full

360° view at all times. He can see both bottom and end plates of the bucket when loading. Other exclusive features include "all-in-one" power train (engine, transmission, drive axle, wheels), longest forward reach, and the famous Baker hydraulic pump and cylinders for long-life dependability.

Shoveloader is versatile, too. Use it for other plant operations with any of the following accessories available at low extra cost: lift-forks, solid tires, narrow bucket, crane hook, and catalytic muffler. Write us or telephone your Baker representative for complete information.



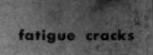
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6581



by William M. Coffey

Markets for Metalworking

The Bureau of the Census, U. S. Dept. of Commerce, has been releasing advance reports on its 1954 Census of Manufactures by industries during recent months. Looks now as though about half of those in metal producing and metalworking industries have been published, with the rest to come during the balance of the year.

The Bureau, incidentally, tells us that they are way ahead of their time on the last general Census of manufacturers, 1947, because of installation of a lot of new electronic data processing machines. But the final job, in bound volumes is not due until next year.

Up-To-Date

Knowing that marketing men rely more heavily on these data (while the figures are fresh) than on anything else, the editors decided to present it in a weekly series. But for general information, most people would want to see how each of these segments of metalworking are doing this year too.

So the job was to use the basic data in the Census Bureau leaflets, update it, find out why the changes occurred, and put it in a package for you, the reader. You will also notice that the chart relates shipments (among other things) to 1947 dollars so as to correct for the inflation we've had since then. This is done by using an appropriate price index. This week, where the industry reported upon its conveyors, we've used the wholesale price index of metals and metal products.

Incidentally, quite a boom in the conveying equipment field!

Watch for reports on foundaries, containers, engines, pumps and compressors, etc., in succeeding weeks.

On this same subject and because management now has or will soon get the 1954 census data, we will also bring you a special feature on how to use these and other marketing data.

Conveyors . . .



. . . moving up.

Fostoria Pressed Steel Corp.

This article will appear in the Aug. 30 issue. It may help determine salesmen's terrtories, location of sales offices, distributors, warehouses, new or expanded plants and a host of other things.

Puzziers

In digging through the puzzler file, we were mortified to find that we hadn't taken care of the cowgrazing puzzler which appeared way back in June 28. Mr. C. V. Smith, Portland Copper & Tank Works, Inc., originally submitted the problem and lays claim to 34,-227 square ft as the answer. Mr. Smith is supported by John Homer, Jr., Norm Chase, James Young and Henry Buresh of the Collins Radio Co.; D. M. Ertner, Western Electric, J. Herb, Westinghouse, Pittsburgh; and G. S. Sangdahl, Jr., Chicago Bridge & Iron Co.

I wonder how C. W. McKinley came up with 11,388.28 sq ft? Don't think C. W. has ever been wrong. Maybe he isn't?



Can 0.0005 inch precision strip simplify your product design?

From 0.0005 in. to 0.040 in. thick and 0.090 to 6 in. wide, these alloys are available as special-tolerance strip:

Beryllium Copper Phosphor Bronze Nickel Silver Brass Chromium Copper Stainless 17-7PH Invar Magnetic: High Nickel

Some immediately available. Others rolled to order in 2 to 21 days. Can be supplied in coils or straight lengths with slit or filed edges—also cadmium plated.

Write for Bulletin 7 TODAY.

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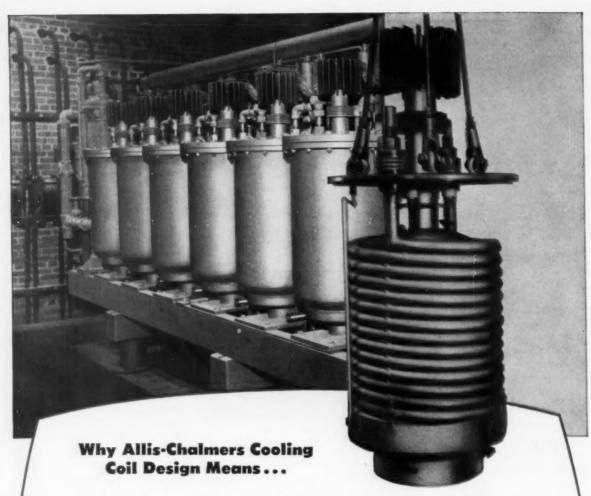
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Simplified Maintenance results from Allis-Chalmers unique unit construction. All active components are attached to the anode plate for easy withdrawal, dismantling, and re-assembling — as illustrated above.

Positive Arc Barrier is formed by the cooling coil, which is insulated from the tank. The main arc is confined within the coil, preventing arc transfer to the tank.

Years of Operation in hundreds of installations have proved the reliability, ease of operation, and simplified maintenance of Allis-Chalmers mercury arc rectifiers. You can get complete information at your nearby A-C office, or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.



ALLIS-CHALMERS



dates to remember

AUGUST

Western Electronic Show and Convention—Aug. 21-24, Pan Pacific Auditorium and Ambassador Hotel, Information, WESCON, 344 N. LaBrea Ave., Los Angeles.

SEPTEMBER

Metal Powder Assn. — Fall meeting, Sept. 7-9, Homestead, Hot Springs, Va. Society headquarters, 420 Lexington Ave., N. Y.

American Institute of Chemical Engineers—Fall meeting, Sept. 9-12, William Penn Hotel, Pittsburgh. Society headquarters, 120 E. 41st, N. Y.

EXPOSITIONS

The Packaging Machinery Manufacturers' Institute, Sept. 11-14, Cleveland.

Assn. of Iron & Steel Engineers, Sept. 25-28, Cleveland.

Metal Show-Oct. 8-12, Cleveland.

Society of Automotive Engineers—National tractor meeting and production forum, Sept. 10-13, Hotel Schroeder, Milwaukee. Society headquarters, 29 W. 39th St., N. Y.

American Die Casting Institute — Annual meeting, Sept. 11-13, Edgewater Beach Hotel, Chicago. Society headquarters, 366 Madison Ave., N. Y.

Porcelain Enamel Institute — Annual meeting, Sept. 12-14, Broadmoor Hotel, Colorado Springs, Colo. Society headquarters, 1145 19th St., N. W. Washington 6, D. C.

American Society for Testing Materials
—Second Pacific area national meeting and apparatus exhibit, Sept. 16-21,
Hotel Statler, Los Angeles. Society
headquarters, 1916 Race St., Philadelphia.

Instrument Society of America — Eleventh annual international instrument-automation conference and exhibit, Sept. 17-21, New York Coliseum, N. Y. Society headquarters, 1319 Allegheny Ave., Pittsburgh.

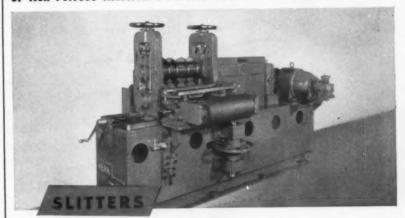
American Hot Dip Galvanizers Assa.— Semi-annual meeting, Sept. 20-21, Greenbrier Hotel, White Sulphur Springs, W. Va. Assa. headquarters, 1806 National Bank Bldg., Pittsburgh.

Steel Founders' Society of America— Fall meeting, Sept. 24-25, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, 606 Terminal Tower, Cleveland.

The Material Handling Institute—Fall meeting, Sept. 24-26, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, 813 Clark Bldg., Pittsburgh.



"Complete Processing and Handling Equipment . . . for any Ferrous or Non-Ferrous Material . . . That Starts — or Ends — as a Coil"



Built to insure dependable, high precision slitting. All thicknesses from .001 to ½", any commercial width. Quick, extremely accurate knife set-up. Also complete high precision slitting lines including pay-off reel, leveler, slitter, scrap winder, scrap chopper and coiling reel.



Wide variety of types and sizes for coiling ferrous and non-ferrous strip. Fixed, adjustable or automatically aligning bases. Automatic oscillating level winding drive if desired. Link type contracting mandrels; manually or hydraulically operated. Furnished complete ready for use.

HERR COMMENT

Write for fully descriptive Bulletin No. 561 today !

THE HERR EQUIPMENT CORPORATION

1260 VINE STREET • WARREN, OHIO
CLEVELAND, INDIANAPOLIS AND BERKELEY, CALIFORNIA



the modern bee uses



CF&I-WICKWIRE WIRE!

Modern bees have stopped storing honey in handy hollow trees. Instead, they choose man-made hives—hives which are neatly divided by wood and special round, tinned, hard drawn, low carbon CF&I-Wickwire Bee Wire.

Chances are you don't need wire to make bee hives. But you may need one or more of the nearly 100 different categories of specialty wire for which CF&I-Wickwire is famous. Let us show you how we can meet your most rigid chemical and physical specifications on high and low carbon wire in all sizes, shapes, tempers, finishes and grades.

Check This List!

FOR THE WIRE YOU REQUIRE, SEE CFAI-WICKWIRE.

FLAT AND SHAPED WIRES

Armor Wire
Bobby Pin Wire
Bookbinder Wire
Brush Wire
Casing Wire
Casing Wire
Curtain Spring Wire
Die Spring Wire
Die Spring Wire
Lock Spring Steel
Rake Tine Steel
Regulator Spring Wire
Snake Fishing Steel
Stapling Wire for Preformed
Staples (Flat)

LOW CARBON FINE AND SPECIALTY WIRE

Bee Wire Bonnet Wire Bookbinder Wire Broom Wire Clip Wire Dent Spacer Wire Drapery Pin Wire Florist Wire Glass Netting Wire
Hairpin Wire
Hook and Eye Wire
Mattress Wire
Picture Cord Wire
Picker Tooth Wire
Pin Ticket Wire
Pin Wire
Ring Traveller Wire
Spiral Binding Wire
Stapling Wire
Stapling Wire
Stapling Wire
Staples
Stone Wire
Weaving Wire
Weaving Wire for Fly Screen Cloth
Wissco Iron Wire

HIGH CARBON FINE AND SPECIALTY WIRE

Aircraft Cord Wire
Armor Wire
Belt Hook Wire
Bobbin Ring Wire
Brush Wire (Tempered and Untempered)
Brush Wire (High Strain)

Chrome Vanadium Spring Wire
Core Wire (Aluminum Cable Steel
Reinforced)
Curtain Spring Wire
Flexible Shaft Wire
"Gamma" Spring Wire
stery Spring Wire)
Zig Zag Wire
No-Sag Wire
Hat Wire

Heddle Wire
Hose Reinforcement Wire
Hose Wire, Mechanical
Hose Wire, Vacuum and Defroster
Rope Wire
Signal Corps Wire
Spoke Wire
Hard Drawn Spring Wire
Oil Tempered Wire
Spheroidized or Annealed Spring

Wire Tire Bead Wire Valve Spring Wire

MANUFACTURERS LOW CARBON COARSE WIRE Basket Handle Wire
Box Binding Wire
Brush Handle Wire
"Cal-Tie" Wire
Can Key Wire
Case Hardened Ball Wire
Claim Wire
Clothes Pin Wire
Clothes Pin Wire
Clothes Pin Wire
Garment Hanger Wire
Hay Baling Wire (Coiled)
Lingo Wire
Lintel Wire
Loop Wire
Merchant Quality Wire
Pail Bail Wire
Rivet Wire
Stapling Wire
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Stapling Wire
Wissco Iron Wire
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Industrial Quality Wire
Lood Rolling Quality Wire
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CF&I-WICKWIRE WIRE THE COLORADO FUEL AND IRON CORPORATION

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque - Amerillo - Billings - Beise - Butte - Casper - Denver El Pase - Fr. Worth - Neusten - Kensas City - Lincoin (Neb.) - Oklahema City - Phoenix - Pueblo - Wichita PACIFIC COAST DIVISION—Les Angeles - Oakland - Portlend - Selt Lake City - Sen Francisco - Seutile - Spokone WICKWIEE SPECKE STEEL DIVISION—Athenta - Beston - Buffalo - Chicage - Detroit - New Orleans - New York Philodelphia - CANADIAN REPRESENTATIVES AT: Calgary - Edmonton - Yencouver



here's why LINE-ARC contactors are industry's first choice No Destructive Arc Shiold Magnetic Dust Problem is Licked Safer Electrical Interlecking These Contactors are a tribute to sound engineering design. They have proved themselves in the severest crane and mill service. They

These Contactors are a tribute to sound engineering design. They have proved themselves in the severest crane and mill service. They respond quickly, due to the light-weight arm construction, handle the arc scientifically, and have long life. The high efficiency and lower upkeep of EC&M "LINE-ARC" Contactors are good reasons for specifying EC&M Magnetic Control for Cranes and auxiliary mill drives.

Write for Bulletin 1145-E.



SQUARE D COMPANY

EC & M. DIVISION

CLEVELAND 28 OHIO













Revolving Carriage





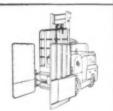




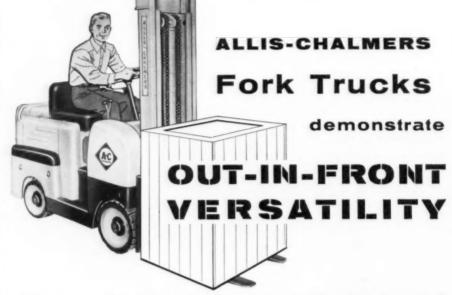




Unloader



Carton Clamp



with a complete line of interchangeable attachments!

Allis-Chalmers Fork Trucks handle all forms of materials with the dexterity of skillful hands. Depending on the type of material or its container, an Allis-Chalmers Fork Truck can be equipped to scoop it, pour it, boost it, hook it, grip it, turn it upside-down . . . even skewer it.

In addition to the standard attachments shown here, there are many more. Allis-Chalmers will be happy to work with you on attachments to meet your own particular material handling needs.

Ask your Allis-Chalmers Material Handling dealer to show you how this out-in-front versatility can speed many jobs throughout your plant, or write for more information.

MATERIAL HANDLING DEPT., BUDA DIVISION, MILWAUKEE 1, WISCONSIN





Swing Shift



Garrett Breakout



Brick and Block Forks





Extension Package Rack



Clamps





Load Stabilizer



PANORAMIC AND CIRCUMFERENTIAL PROJECTORS

> GAMMA sources equipment containers

DIRECTIONAL PROJECTORS



films, cassettes, tanks, chemicals, darkroom sundries . . . everything

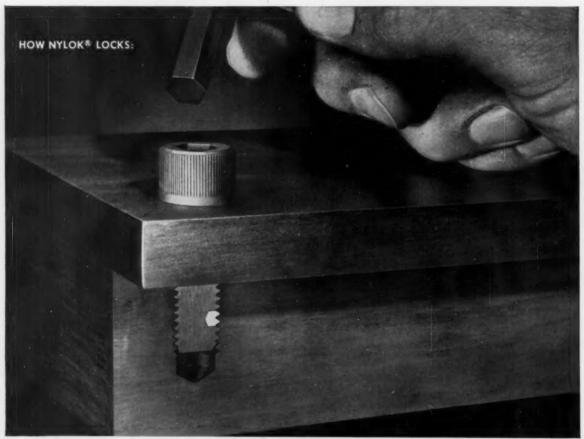
PICKER ... your ONE stop

for every need in industrial radiography

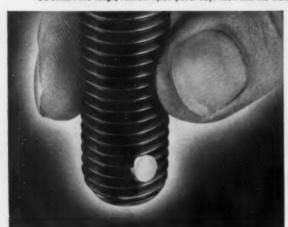
PICKER X-RAY CORPORATION, 25 SO. B'WAY, WHITE PLAINS, N. Y. BRANCHES IN PRINCIPAL CITIES IN U.S.A. and CANADA



NEW-a complete line of socket screw products



LOCKED! The tough, resilient nylon pellet keys itself into the mating threads. It forces threads together, and locks the screw securely.



BEFORE ASSEMBLY. The nylon pellet projects slightly beyond male threads. When assembled, female threads will be impressed into it. Pellet locks effectively whether the screw is seated or not.



AFTER REMOVAL. "Plastic memory" of pellet has expanded impressed threads to greater diameter than screw threads. Screw can be used repeatedly. In use, "memory" keeps threads tightly locked.

self-locking UNBRAKO that won't work loose

They simplify design and save production time

UNBRAKO socket screws are now available embodying the Nylok*self-locking principle. Nylok provides a truly practical new solution to the problem of making screws self-locking.

An UNBRAKO screw with Nylok is a single self-locking unit. No auxiliary locking devices are needed. Just thread the UNBRAKO into any tapped hole. Seated or not, it locks positively wherever wrenching stops. The tough, resilient nylon pellet forces mating threads together and holds tight. The screw will not shake loose.

You save production time when you build products with self-locking Unbrakos. And you get greater simplicity in design with less bulk and weight. The number of parts you must assemble to achieve full locking action is reduced to the absolute minimum. Lockwashers under screw heads are no longer necessary. Costly wiring of cross drilled heads is eliminated. So are cotter pins and complex multiple set screw installations.

Self-locking UNBRAKOS are completely reusable. They have uniform locking and installation torques—with no galling or seizing on mating threads. They successfully withstand temperatures from —70° to 250°F. And, on properly seated screws, the pellet acts as a liquid seal.

Self-locking UNBRAKO socket screws come in a complete range of standard sizes and materials. See your authorized industrial distributor. Technical data and specifications are detailed in Bulletin 2193. Write us for your copy today. Unbrako Socket Screw Division, STANDARD PRESSED STEEL Co., Jenkintown 17, Pa.

*T.M. Reg. U.S. Pat. Off., The Nylok Corporation

UNBRAKO SOCKET SCREW DIVISION

STANDARD PRESSED STEEL CO.





Socket head cap screws. Standard sizes #6 to 1 in.



Socket shoulder screws. Standard sizes 1/4 to 3/4 in.



Socket pressure plugs. Standard sizes 1/4 to 11/4 in.



Socket set screws. All standard point types. Standard sizes #6 to 1 in.

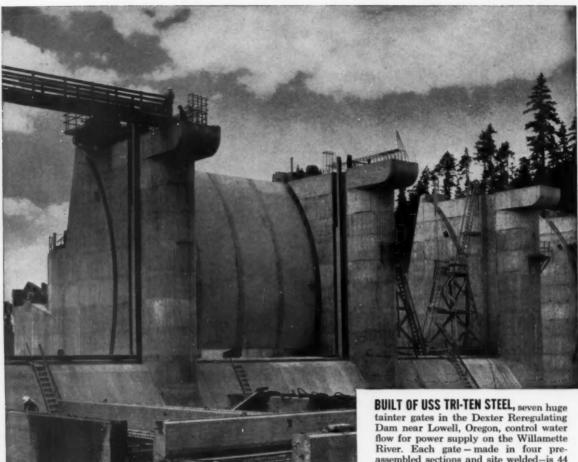


Flat head socket screws. Standard sizes #6 to ¾ in.



Button head socket screws. Standard sizes #6 to % in.

You can make it better





BUILT OF USS TRI-TEN STELL, seven huge tainter gates in the Dexter Reregulating Dam near Lowell, Oregon, control water flow for power supply on the Willamette River. Each gate—made in four preassembled sections and site welded—is 44 ft. wide and 38 ft. 7 in. high. Shipping weight is approx. 116,000 lbs. USS TRITEN Steel was selected for this important installation because of its high yield strength—which permitted the use of lighter weight plates and shapes—and also on account of its higher corrosion resistance—equal that of copper steel. (Gates fabricated by Willamette Iron & Steel Co., Portland, Ore., for the Portland District of the Corps of Engineers.)

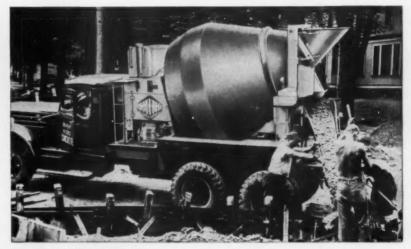
IN FARM EQUIPMENT, like this Rol-A Dam dammer built by Gunning Manufacturing Co., Lansford, N. D., the use of USS High Strength Steels in vital parts effectively increases life and dependability. Here, USS Man-Ten Steel in the dammer blades provides superior abrasion resistance plus lightweight and extra strength and toughness. As one manufacturer puts it, "Because farm equipment takes terrific abuse in the field and is generally exposed to the weather without any protection whatsoever, we have found high strength steel construction a 'must'."

with USS High Strength Steels



CORROSION RESISTANCE is important in sign poles like this manufactured by C. J. Glasgow Company, Detroit, Mich. Due to the method of construction and design of upright and sign. inside cannot be kept painted and is subject to corrosive damage. Built with USS COR-TEN Steel, which has 4 to 6 times the resistance to atmospheric corrosion of carbon steel. poles last 2 to 3 times longer. The higher strength of COR-TEN Steel also makes it possible to use steel in lighter gages, saving weight which reduces shipping costs and makes erection easier.





RESISTANCE TO ABRASION, plus the added strength and corrosion resistance supplied by USS Man-Ten Steel, greatly reduce maintenance and add years of service life to the drum of this highly efficient concrete mixer, built by the T. L. Smith Company, Milwaukee, Wisc. Man-Ten Steel's ability to resist the grinding action of stone, sand, slag and cement is so generally recognized that the use of Man-Ten Steel in drums has become almost standard construction by leading manufacturers of truck mixers.

IN USS HIGH STRENGTH STEELS, design engineers have at their command three service-tested steels that will permit them to materially increase the efficiency and economy of machinery, equipment and structures at little or no increase in first cost . . . and frequently, at a saving.

All three of these famous "steels that do more" - USS COR-TEN, USS MAN-TEN and USS TRI-TEN - have a 50% higher yield point than ordinary carbon steel. All have better corrosion resistance and offer greater resistance to wear, fatigue and impact. Each, however, has specific superior properties that should be considered in determining its selection.

USS COR-TEN Steel, for example, is distinguished by its superior resistance to atmospheric corrosion-4 to 6 times that of carbon steel. USS MAN-TEN Steel is intended for weight reduction by means of greater strength in moderate forming applications, with enhanced resistance to abrasion and atmospheric corrosion. USS TRI-TEN Steel's outstanding characteristics are excellent weldability and resistance to shock at low temperatures.

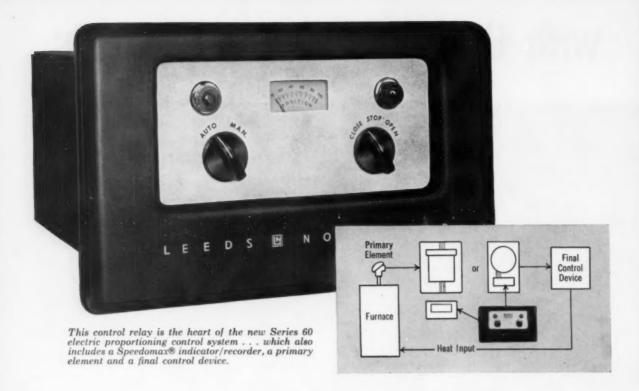
Used singly or in combination, these steels can advantageously replace carbon steel to increase the strength and durability of vital parts without increasing their weight. Or when the use of thinner sections is feasible they can (1) reduce equipment weight without reducing its strength, or (2) increase the size and capacity of equipment without increasing total weight or the power required to move it.

You will find our 174-page "Design Manual for High Strength Steels" extremely useful in applying the benefits of these steels to your product. Send for free copy-simply write on your company letterhead to United States Steel Corporation, Room 5455, 525 William Penn Place, Pittsburgh 30, Pa.

HINTED STATES STEEL CORPORATION, PITTSBURGH

AMERICAN STEEL & WIRE DIVISION, CLEVELAND COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO . NATIONAL TUBE DIVISION, PITTSBURGH

TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. . UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS UNITED STATES STEEL EXPORT COMPANY, NEW YORK



WITH THIS NEW SERIES 60 CONTROL

You can push your furnace HARDER

■ If you're wasting valuable furnace time bringing a batch to temperature . . . slowing down heating rate to prevent overshoot . . . Series 60's adjustable rate of approach will bring furnace to control point smoothly—safely—in shortest possible time.

If you're losing production on your *continuous* processes due to hot spots...slow start-ups...poor combustion, Series 60's sensitivity, speed of response and control actions will provide fast, uniform heat distribution within the furnace...head off temperature departures as soon as they start.

Regardless of your process, if your furnace, your product and your production isn't benefiting fully from your present controls, it'll pay you to look into Series 60.

COMPLETE, FLEXIBLE SYSTEM Heart of this flexible system is L&N's new, compact Series 60 electronic proportioning control relay which receives information from the Speedomax indicator/recorder... immediately amplifies it and adjusts the final control device to hold temperature in line. This control relay is only 6" x 11" x 11"—about half the size of the Series 50 unit which it replaces. It's an integral part of our new Speedomax H instruments... mounts in its own case when used with Speedomax G. Expendable components—tubes, electrolytic capacitors, etc.—are plug-in for fast servicing.

VARIETY OF CONTROL ACTIONS Series 60 is

available for Position-Adjusting Type (P.A.T.) or Duration-Adjusting Type (D.A.T.) control.

P.A.T. regulates input by adjusting the position of a valve; D.A.T. provides a two-position operation of the final control device . . . regulates input by adjusting the durations of heat-on time of a contactor, or of full-open time of a valve.

P.A.T. is supplied for single-action (proportional) or 3-action (proportional, reset and rate) control . . . D.A.T. for two-action (proportional and reset) or 3-action control. Proportional regulates input according to size . . . reset according to duration . . . and rate according to speed of temperature change. Choice of type depends upon your product, your process and your production.

In the 3-action units, reset and rate operate independently—permit optimum settings for best possible control. Reset is adjustable from 0-100 repeats/min; first step above zero is .01. Rate time is continuously adjustable from 0-8 minutes.

For a full description of Series 60 control, contact your nearest L&N office, or write 4956 Stenton Avenue, Philadelphia 44, Penna.



MACHINE OF THE MONTH

PREPARED BY THE SENECA FALLS MACHINE CO. "THE So-owing PEOPLE" SENECA FALLS, NEW YORK



Seneca Falls Model "LN" Automatic Lathe designed with standardized units including a "PACKAGED" automatic loader and ejector mechanism.

PROBLEM: To remove welding flash from worm shaft assemblies on a highproduction basis.

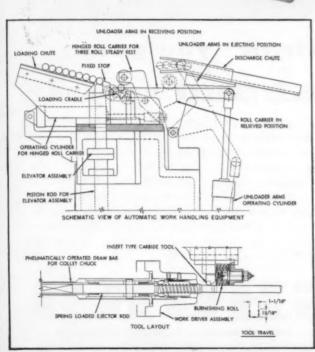
SOLUTION: A Seneca Falls Model "LN" Automatic Lathe was equipped with certain standardized units to provide a specialized high-production machine at sub-

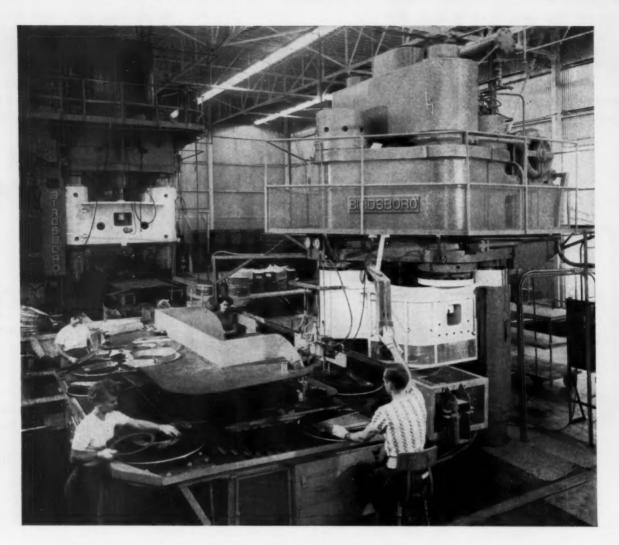
stantial savings in initial cost and lead time.

Red hot welded parts are delivered by a conveyor, which joins the loading chute shown in the line drawing illustrating the automatic work handling equipment. The work piece is held and driven in a collet chuck and supported by a hinged three-roll steady rest. A carbide tool on an overhead slide removes the hot flash and is followed by a burnishing roll which smoothes the junction of the welded parts.

The entire loading, machining and unloading operations are entirely automatic; however, push button controls are installed for the manual operation of each movement. The loading cycle cannot get out of time since the automatic sequence is controlled by a system in which each movement is initiated by the completion of the preceding movement. A production of 275 pieces per hour is readily obtained with this equipment.

SENECA FALLS MACHINE CO., SENECA FALLS, N.Y.





What are the "extras" you get in

BIRDSBORO presses?

DESIGNERS AND BUILDERS OF:

STEEL MILL MACHINERY
HYDRAULIC PRESSES
(Metalworking and Extrusion)
CRUSHING MACHINERY
SPECIAL MACHINERY
STEEL CASTINGS
Weldments "CAST-WELD" Design
ROLLS: Steel, Alloy Iron, Alloy Steel

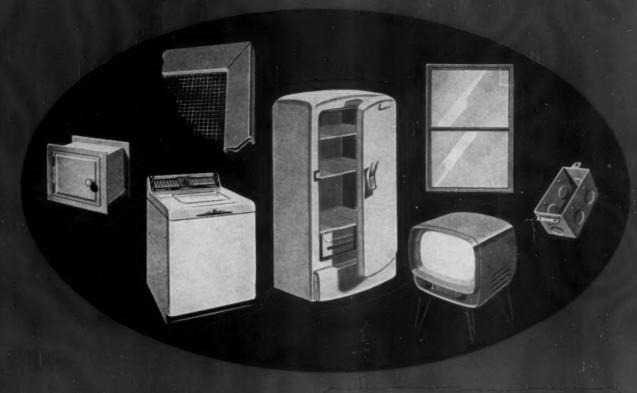
• They're not "added" extras, because they enter the make-up of every BIRDSBORO Press before the materials and components. They're basic with BIRDSBORO...applied to your press while it's still in the idea stage. Engineering vision, human craftsmanship, imagination, new ideas...the BIRDSBORO "extras" that form an integral part of the press you order. And the result is better performance. Sometimes these extras represent an extension of your ideas, sometimes they result from the advanced engineering ability of our staff, but always they are born of BIRDSBORO's desire to produce a better press. A representative can show you the many benefits of ordering and operating a BIRDSBORO press. Call him in soon.

BIRDSBORO

BIRDSBORO STEEL FOUNDRY & MACHINE CO., Main Offices in Birdsboro, Pa. District Office: Pittsburgh, Pa.

New York Office: Engineering Supervision Co., 120 West 42nd Street, New York 36, N.Y.

in the long run, galvanized steel...



in the longer run, WEIRKOTE

More and more, Weirkote is proving itself to manufacturers of a wide variety of products—under the sternest tests—as a galvanized steel that goes far beyond ordinary galvanized steels.

A special continuous galvanizing process is quality-controlled all the way to make Weirkote withstand the severest stresses of fabrication. Its tightly bonded zinc coat resists cracking, peeling, flaking; resists corrosion for moisture cannot penetrate to attack the steel underneath.

And Weirkote's greater strength, rigidity and heat-resistance provide longer life with little or no maintenance.

So for durability, economy, appearance . . . in the longer run, Weirkote is your best buy. Put it to work now improving your product . . . and your profits!



ON STEEL COMPANY

NATIONAL STEEL 🦀 CORPORATION





PUNCHING — Presses used for punching holes, knockouts, and stamping small parts are strategically located throughout our plants. Some of them run at a rate of 108 strokes a minute, and their capacity runs up to 250 tons. Small boiler-jacket parts are being stamped here for United States Radiator Corporation.

PLANNING OR
FABRICATING A SHEET
STEEL PRODUCT?



...Republic can take the

You may not realize how many different products are made in Republic's Berger Division plants because many are fabricated for other manufacturers and marketed under their brand names. We will manufacture your product in volume runs—engineer, fabricate, finish, pack and ship, all to your specifications.

Some of our contract-fabricated products are completely assembled units with operating mechanisms installed. Others are sheet metal assemblies that leave our plants finished with a prime coat, ready for final finishing, assembly and packing by our customer.

Our large stock of standard tools and dies and the specialized equipment of our Berger Plants are available to you. Often we can reduce costly tooling investments be-

cause we already have the tools to do the job. Because you use our facilities, you can eliminate the overhead problems of building or expanding your plant.

Constant research and development at Berger have resulted in advanced processes and equipment to make your fabricated sheet steel products more attractive, and more economical. Furthermore, our facilities and fabricating experience provide you with the same high quality you see in our own products—lockers, office furniture, shelving and steel kitchens.

If you have a sketch or blueprint, send it along to us with complete specifications. We'll tell you promptly what Berger's specialized service can do for you. Learn more details in Bulletins 793 and 908.

REPUBLIC



Ucild's Widest Range of Standard Steels



3 FORMING—Brakes running at speeds up to a stroke a second range in capacity from 60 to 500 tons making possible production of a variety of items and gages simultaneously. Operators shown here are forming boiler jacket backs. The next stop will be the welding department.



5 PAINTING—We're equipped to paint over 87,000 square feet of steel surface each hour. Equipment includes mechanical bonderizers and degreasers for cleaning mill stock parts; 32 spray booths, six mechanical dip tanks . . . plus 40 baking ovens to assure beautiful, lasting, baked-on finish. And we can match your sample for color.



4 WELDING—Berger's major plant facilities include the very latest welding equipment and techniques. For every requirement there's a specific unit located to do the best job most economically. Eightyeight welding units are available. The operator above is spot-welding stiffener channels.

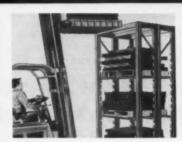


6 PACKING AND SHIPPING—Boiler jackets are shipped in cartons, knocked down. Packing equipment includes newest machines for cratemaking and automatic nailing. Beyond our doors, more advantages—you are shipping from centrally located Canton, Ohio.

whole job off your hands



INDUSTRIAL LOCKERS—These popular Republic Double Tier Lockers are fabricated at Berger, long a leader in the manufacture of all types and sizes of steel lockers for every requirement. Berger will help you plan your locker installation. Send coupon for details.



PALLET RACKS—Another Republic product made by Berger makes it easy to palletize bulky items of tremendous weight. Rack permits two-way entry . . . plus removal of pallets from any level without unstacking and restacking. Sizes available up to 10 feet high.



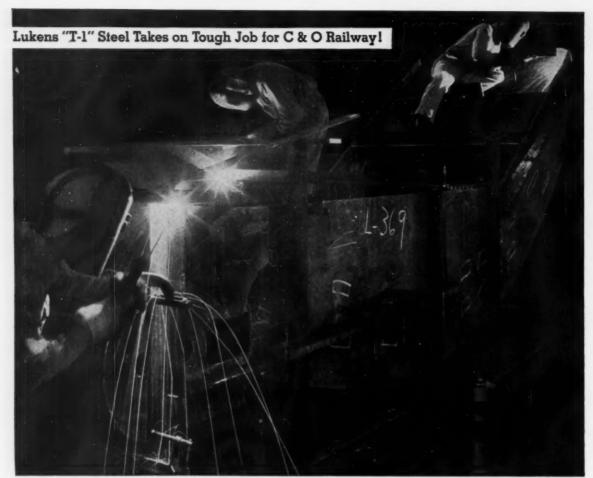
WEDGELOCK STEEL SHELVING—The world's strongest shelving, specifically designed for high stacking of enormous weights. Joints actually get tighter as the weight increases. There's no distortion or instability. Wedgelock is completely flexible for easy rearrangement.

STEEL

and Steel Products

Company_____

City_____State____



Horne Brothers of Newport News, first-line fabricators to the shipping industry, are building several new, improved coal trimming machines for the C&O Railway. Lukens "T-1" steel was

specified to cut weight, combine strength and abrasion resistance. A number of other Horne Brothers' projects of Lukens "T-1" steel are already in the works.

Fabricator of unique new coal loader says:

"NEVER WORKED WITH AS TOUGH AND STRONG A STEEL THAT'S SO EASY TO WELD!"

■ Enthusiastic is the word for Horne Brothers' reports on Lukens "T-1" steel. They call it the best steel yet to combine strength and toughness, impact and abrasion resistance, and the all-important feature of excellent weldability.

Lukens "T-1" steel is economical, too. On this coal loading machine, for example, Horne Brothers was able to effect a 25% reduction in overall plate thickness—a direct result of this new steel's great strength. The finished machine will weigh far less than previous trimmers, operate with greater efficiency, less maintenance and increased life expectancy.

No wonder Horne Brothers is so well satisfied. No wonder they are planning to build more equipment of Lukens "T-1" steel—right away!

If your problem is equipment

weight...abrasion, impact or atmospheric corrosion...the need for toughness at temperature extremes...it will pay you to investigate this amazing new alloy steel now.

For the latest in fabrication techniques and specifications, write to Manager, Marketing Service, 847 Lukens Building, Lukens Steel Company, Coatesville, Pennsylvania.

LUKENS "T-1" STEEL



THE NEWEST IN A COMPLETE LINE OF ALLOY STEELS LUKENS STEEL COMPANY, COATESVILLE, PENNSYLVANIA

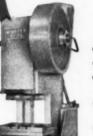
STEEL FRAME

GAP PRESS

SERIES G1 PRESSES

Patents Pending

Today's most rigid and efficient gap presses—G1 Steel Frames, are engineered and fabricated with a completely new approach to the problem of achieving minimum deflection in steel "C" frames for gap presses.



CAPACITIES OF

75, 110, 150 and 200 Tons

- Fixed Base or Inclinable
- Flywheel or Geared Types
- Minster Patented Combination Air Friction Clutch and Brake
- Barrel Slide Adjustment and extremely long Slide Ways
- · Power Inclining

MINSTER G1-150 ton geared type gap press—Motorized Inclining—Cabinet Legs house all electrical and air controls—Connect Air Line and Plug in power; in seconds, it's ready to operate

CONDENSED STANDARD SPECIFICATION

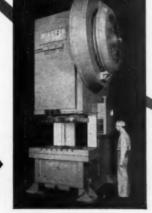
CAPACITY	STD. STROKE of slide	STROKES per minute	BED AREA	SLIDE AREA
75 tons	4	Flywheel 90 or 120 Geared 40	24 x 36	18 x 24
110 tons	5	Flywheel 80 or 105 Geared 37	27 x 42	21 x 28
150 tons	6	Flywheel 80 or 105 Geared 30	30 x 50	24 x 34
200 tons	8	Geared 28	34 x 58	28 x 36

Build a sound replacement program modernize with Minster Presses

MINSTER

Series G1-75 flywheel type inclinable gap press with manual inclining and standard leg.

The 200 ton G1 fixed base geared type gap press—Available with either bed attached or siiding type die cushion.



THE MINSTER MACHINE COMPANY, MINSTER, OHIO



This "Buffalo" High Production Pinch-Type Bending Roll, available for immediate delivery has the following special features:

- 7" diameter Pinch Rolls, 22" long.
- Power operated out-board bearing.
- 10,000# air and hydraulic pressure on upper roll bearings.
- High power lift of upper roll.
- · Variable speed drive.
- 15 H. P. motor and controls (3 ph. 60 cy. 220/440 volts).
- Third roll adjustment from front of machine.
- Bijur one-shot oil lubrication system.
- · Adjustable entry guide and rear guide.
- · Heavy welded steel frame.
- All air-draulic controls and accessories.
- Roll speeds from 35 feet to 95 feet per minute.

 With interchangeable special form rolls machine can be used for beading and modified forming up to and including 3/16" thickness in mild steel.

TYPICAL CAPACITIES FOR BENDING
IN ONE PASS (MILD STEEL — 60,000# T. S.)

Thickness	Width	Inside Diameter
1/8"	22"	8"
3/16"	22"	12"
1/4"	22"	14"
5/16"	18"	16"
3/8"	12"	18"
1/2"	10"	20"

WRITE TODAY FOR SPECIAL QUOTATION

*Subject to Prior Sale

BUFFALO FORGE COMPANY

492 BROADWAY, BUFFALO, NEW YORK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING

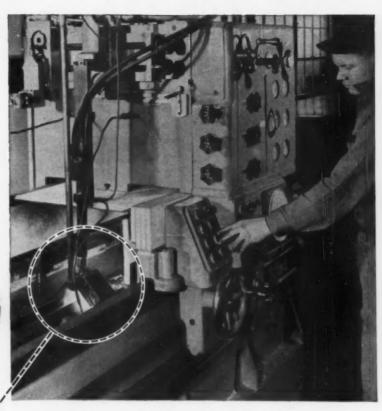
PUNCHING

SHEARING

BENDING



HIGH SPEED FLAME-HARDENING





Cross-section view shows uniform depth of hardened surface.

SPECIAL MACHINE UPS LIFE OF GRAPHITIC STEEL PARTS

LINDE engineers have assisted Cincinnati Steel Treating Company in developing a flame hardening machine which increases service life of 16 ft. long, graphitic carbon steel lathe ways . . . Development of this automatic, high speed machine is another example of how LINDE Service Engineers are helping LINDE's customers up production speed and unit quality through co-operative research engineering.

With this new machine, a lathe way to be treated is placed on a magnetic chuck in a water filled channel. Flame-hardening heads and control mechanism move at predetermined speeds along the part. After it cools, the lathe way is placed in a refrigerator for 24 hours which stabilizes the steel, and brings its case hardness to a minimum of 60 Rockwell "C" scale.

The benefits of Linde's research, engineering, and over 40 years of accumulated know-how stand behind each of its customers to help them solve production problems. Get these "plus-values" which Linde offers—it pays you to do business with Linde.

Linde Air Products Company

A Division of Union Carbide and Carbon Corporation

30 East 42nd Street III New York 17, N. Y.

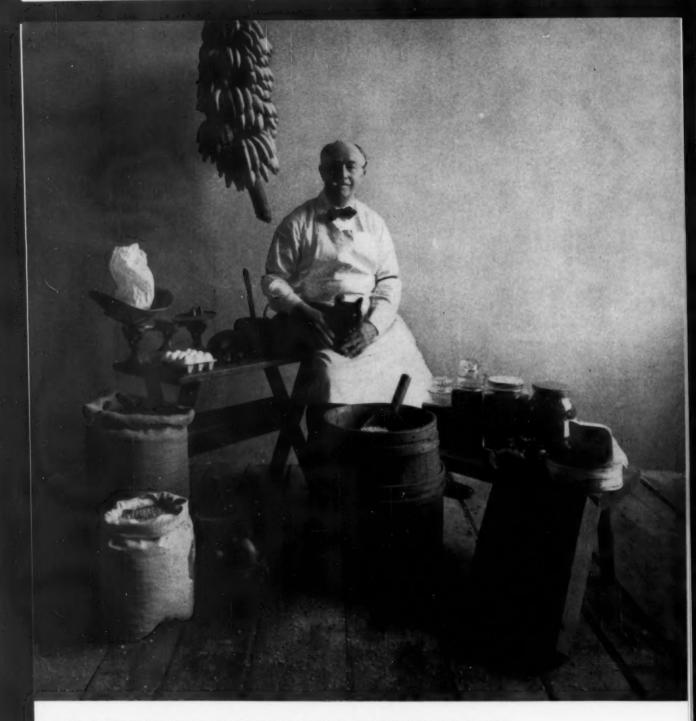
Offices in Other Principal Cities

In Canada: LINDE AIR PRODUCTS COMPANY

Division of Union Carbide Canada Limited, Toronto

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WHO TOOK THE CAT OUT OF THE GROCERY BUSINESS?

You don't have to be as old as the hills to remember when practically everything you lugged home from the grocery store came out of a sack, a crate or a barrel. The revolution in food packaging has taken place within recent years. Can-makers and food processors have placed on our tables an infinite variety of basic foodstuffs and exotic delicacies. Steel has shared in this progress. At Inland, we've been working closely with can and container manufacturers for many years, helping to make steel an increasingly versatile and useful packaging material.

INLAND STEEL COMPANY 38 South Dearborn Street, Chicago 3, Illinois Sales Offices: Chicago, Milwaukee, St. Paul, Davenport, St. Louis, Kansas City, Indianapolis, Delroit, New York. Steel products supplied to the steel container industry include tin plate, black plate, hot and cold rolled sheets and strip. Other products: plates, structurals, Ti-Co galvanized sheets, 1-Way safety plate, bars, reinforcing bars, rails and track accessories, coal chemicals.



THE IRON AGE

NEWSFRONT

Nickel Easing? Maybe Yes, Maybe No

Government may slacken off its stockpiling of nickel. Or then again, it may not. Meanwhile, wary users are swallowing the reports of reduced stockpiling with a heavy seasoning of salt. One manufacturer, recalling earlier stories of this sort, says he was promised more nickel in second quarter; wound up taking a 15 pct cut. One estimate of stockpile: 300-million lb.

Operation Changeover Moves Along

Both Air Force and Navy are completing the changeover from propeller-driven to jet planes faster than was thought possible. By July 1, Navy fighter plane strength will be 99 pct jet. All Air Force fighters are now jets—with B-36 only prop-driven or partially prop-driven major combat plane remaining. Navy bought 1300 planes last year, Air Force 1400.

What's Shot Peening Cost?

About 2 pct. That's the average premium added to the tab for a part shot-peened in volume, says one of nation's six independent peeners. Way to reduce cost: stop using peening as an added safety factor or as last resort to reduce failures—design for it instead. Designed-for-peening parts, says spokesman, should be lighter and, in some cases, smaller.

More On Industrial Films

Movies are better than ever. At any rate, well-known machine tool builders are bearing down harder on this medium for sales, operator training. A new directory of films available from builders lists 123 titles—most 16 mm sound reels, 79 of them in color. Individual builder demands for the free films is heavy, means 3 to 4 week waiting period for prospective viewers.

Coal Is Not For Them

Though a water shortage cost them 90,000 tons of production this Spring, the world's second largest aluminum producer is not considering falling back on coal. Aluminium Ltd. says there

are a number of water bodies near its present western Canadian sites; plans instead to tunneljoin these with present hydro sources to prevent future low-water power losses.

Freight Rate Side Effect

Readjustment of auto freight rates this year is slowly killing off what previously was a thriving business in Detroit. Equalizing the cost of autos has forced at least four drive-away companies to go out of business since January. Remaining firms, which use vacationers to drive cars to distant points, report a definite drop in business.

Radioisotopes—Expanding Fast

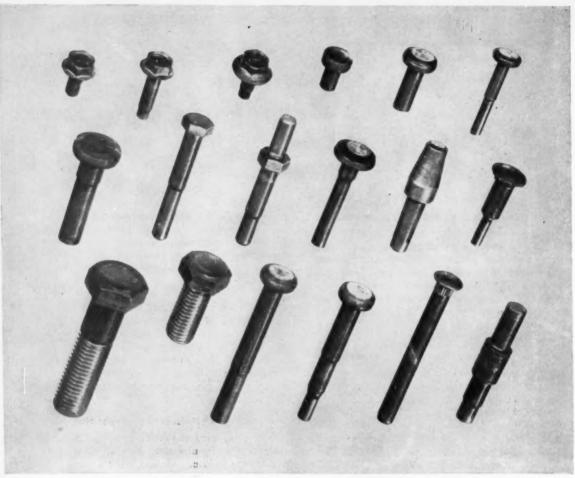
Industry's latching on to radioisotopes at a great old rate. For the first time, pace at which companies are buying isotopes for inspection, tracers, etc., is running at nearly double the annual average for the total 10-year period during which they've been made available to industry. Easier AEC rules, improved handling methods get much of the credit.

Gas Infrared Heater

A new gas infrared heater which employs a ceramic combustion chamber to generate infrared rays from natural, artificial or propane gas is attracting interest from several quarters. A major automaker is investigating carefully for paint oven possibilities. Porcelain enamelers have reported excellent results at substantial savings. Construction industry eyes it for drying of cement and plaster.

Vacuum-Melting Improvement

One steel producer is getting ready to move an improved vacuum furnace out onto his shop floor, to handle 2000 lb melts on a production basis under continuing vacuum. Now in the lab, the equipment is handling 300 lb melts of high-temperature alloys. Operators can make alloying additions at will, can pour and remove the completed heat without destroying vacuum.



Is your part illustrated? These are representative of the shapes that can be cold formed more effectively with Granodraw.

GRANODRAW® PROCESS INCREASES TOOL LIFE 2-5 TIMES IN COLD HEADING STEEL FASTENERS

Thorough research, in cooperation with a leading manufacturer of headed fasteners, has proved the value of Granodraw phosphate coating of stock prior to cold working. Typical of the improvement in tool life and in production are the examples shown in the table.

But the advantages do not stop here in cold heading fasteners or cold working other products. This chemical treatment process permits greater speed of draw; greater reductions within the physical limits of the metal; more passes with the same number of intermediate treatments; and the possibility of fewer process anneals. It also results in less downtime of machines, better surface finish on products, cold forming of more complex shapes, fewer rejects, and a cleaner shop.

Write us for complete information about Granodraw and its application in cold forming operations. PRODUCTION AND TOOL LIFE

PRODUCT	MATER	IAL	AV. PIECES PER	DIE DRESSING
PRODUCT	Tool	Stock	Granodraw-Treated	Other Treatment
% x % rivet	Hardened Alloy Steel	10 10 Steel	647,000	180,500
5/16 x 24 flat head shoulder bolt	Hardened Alloy Steel	10 10 Steel	26,000	5000-8000
Hex Head Cap Screws	Hardened Alloy Steel	1038 Steel	53,000	13,000-14,000
1/4 x 20 Hex Machine Bolt	Hardened Alloy Steel	10 18 Steel	28,000	13,000

Note. Although investigations on the life of carbide tools are not completed, one item deserves mention. A 5/16 x 24 hex head shoulder bolt showed a strikingly low carbide tool life of 67,000 pieces per die. Using Granodraw-treated rad, one die produced 105,000 pieces—another 194,000 pieces. And both dies were in good condition at the end of the run.

AMERICAN CHEMICAL PAINT COMPANY, Ambler 20, Pa.

DETROIT, MICHIGAN

ST. JOSEPH, MISSOURI

NILES, CALIFORNIA

WINDSOR, ONTARIO





AFTERMATH: Worst Is Yet To Come

Metalworking came through steel strike in fair shape . . . But scramble to avert delayed-action shutdowns will be worst since 1952 . . . Construction is hardest hit . . . Consumers poised to raise own prices.

◆ THE WORST IS yet to come.

Metalworking came through the steel strike itself relatively unscathed. But with mills straggling back into production this week after settlement of contract details, the wear and tear on consumer inventories was beginning to hurt.

An Iron Age survey of major metalworking industries confirmed that the scramble for steel for the balance of this year and into 1957 will be the worst since the post-strike period of 1952. The one big difference this year is the three-year contract negotiated with steel labor. Assurance of continued production is likely to temper the inventory-building policies of consumers.

Nevertheless, Eugene Grace, chairman of Bethlehem Steel Corp., probably was understating the case when he said that there would be hell a-popping in the steel market for the rest of 1956. For some consumers, it will be tough well beyond this year.

Tough Job Ahead

The loss of over 11 million ingot tons of production is only part of the story. Mills are now confronted with the overwhelming job of rearranging production and delivery schedules. Available ingots must be allocated to dozens of competing products. Although ingot production probably will be back to pre-strike levels in about three weeks, mill maintenance problems will tend to limit output in the months ahead. Damage to steelmaking furnaces during the strike was extensive.

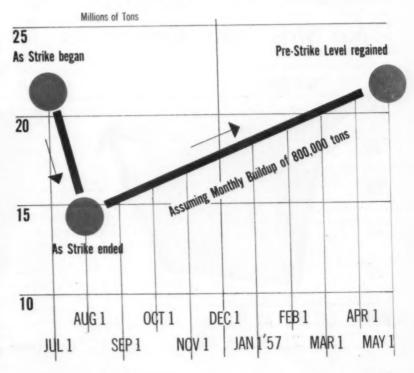
The strike ended technically with the signing of a memorandum of agreement on major issues July 27 (IRON AGE, Aug. 2, '56, p. 47). But contract details kept most plants idle for another week or more. U. S. Steel's strike officially ended at 8 p.m. Aug. 3. Other major producers followed suit.

The walkout hit hardest at construction. And the steel industry itself suffered along with its customers. Steel expansion projects halted when the strike began. Scores of highway programs were thrown behind schedule. Construction of schools, hospitals, and buildings was delayed.

Foreign steel and premiumpriced steel was getting some metalworking plants over the hump. Gray market operators were out in force, charging whatever the traffic will bear. Seamless tubing was reported going for double the regular mill price. Some foreign plate was being offered for \$240 to \$300 per ton, but finding few takers as consumers held out desperately for mill shipments to get them off the hook.

Meanwhile, fabricators generally were poised to raise their own prices in line with price boosts

Steel Inventories: How Long to Rebuild



SPECIAL REPORT

put into effect by the mills (see page 124). Except where competition forces a hold-the-line price policy, the cost of fabricated steel products will rise.

Here's what IRON AGE editors found in an industry-by-industry survey of the strike's impact:

Automotive . . . Steel's best customer is back into the market with both feet. With new model production about to begin, automotive purchasing agents are taking no chances. They were lining up delivery schedules well before the strike ended, will be among the first to take shipment. Prospect of a sales pickup when new models appear means that the carmakers' steel "take" during last half will be up, compounding the procurement problems of other consumers.

Crisis Coming

Construction . . . Desperate for structurals, plate, wire mesh, and other shapes. Some authorities estimate that each day of strike means two days' delay in construction projects. Construction equipment makers also in trouble.

Impact of the strike will be felt from coast-to-coast. Projects already facing delay include the St. Lawrence Seaway, New York State Thruway, steel and power expansion, highways, schools, hospitals, office and commercial buildings.

Pinch will worsen before deliveries can be made. Supply crisis will reach its peak in September, but after-effects will linger into 1957. Winter weather will add months to the delay on some projects originally scheduled to be under roof in the Fall.

Freight Cars . . . Pullman-Standard halting shipment of finished freight cars Aug. 15, probably will not resume deliveries for six weeks. Carbuilders generally, operating at 60 pct during the strike. will hold to reduced schedules for at least 30 days. Estimates of strike losses in plate and structurals running as high as 21/2 months. Bessemer, Ala., plant of Pullman-Standard closed indefinitely, not likely to resume production before 45 days. Industry backlogs extend through 1957 and beyond.

Oil and Gas... Big drillers are in fair shape from inventory standpoint, but little wildcatters and pipe jobbers are in trouble. A major eastern oil company halting drilling of new wells in its Texas and Louisiana fields until steel supply pipelines are back to normal. Demand for oil country goods and linepipe, strong before the strike, will be intensified.

Gulf Oil Corp. figures it will get about 75 pct of the steel it had planned on for balance of the year. Gulf looks for fourth quarter shipments of well-drilling steel to be about 60 pct of normal. Gulf expects its new construction projects will be delayed about two months. Seamless tubing finding takers at double regular mill price.

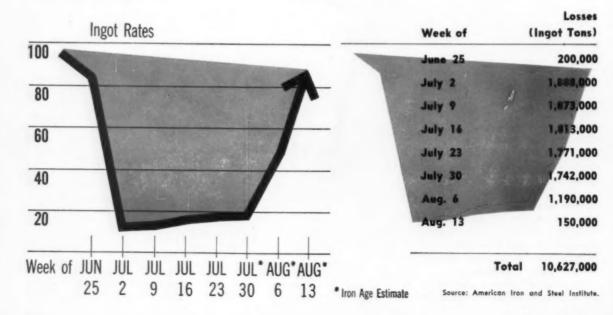
Equipment . . . A Northern Ohio crane builder is re-establishing delivery dates by adding the strike duration plus three weeks to original schedule.

Mill Builders Okay

A fabricator of heavy bases for machine tools and presses says deliveries will be pushed back two to three months; his inventory down to about 2-3 weeks and mill delivery dates uncertain.

Steel mill equipment builders are in good shape. Major builders have had no production cutbacks and do not expect any. Industrial furnace builders appear to be weathering the storm without serious problems, for the moment.

What Strike Cost Consumers



American Brake Shoe Co., manufacturer of railroad track equipment, cutting back to 40-hour weeks by eliminating Saturday work in order to avoid layoffs. Company had been working 53-hour week.

Pivot Punch and Die Corp., N. Tonawanda, near Buffalo, buying steel from as far away as Chicago to prevent curtailment.

Appliance Picture

Construction equipment makers, already hurt, expect squeeze to tighten by end of August. Farm equipment industry, suffering through a business recession, has steel running out its ears. Electrical machinery builders in good position.

Appliances . . . Generally not suffering, although small appliance distributors are concerned about future supply. Some producers have advised distributors that order books are full for the year.

General Electric Co. reports no lost appliance production, but points out that planned new construction has been delayed. Hence new facilities won't be brought into production as scheduled.

Warehouse Stocks

Westinghouse Electric Corp., just getting its breath following a long strike in its own plants, says production was normal during the steel walkout. Even so, the company feels that a few spot shortages may develop, but expects maximum holdup in any department will be 30 days. Westinghouse took in steel while its plants were strike-closed.

Warehouse . . . Stocks of structural and plate virtually wiped out. American Steel Warehouse Assn., which has been spot-checking weekly for the government, reports that in almost no cases did warehouse inventories generally drop to 50 pct of the June 30 level where restrictions to safeguard defense contractors became effective.

Some shortages developing in hot-rolled bars, particularly in diameters of one to four inches.

Iron Ore . . . Great Lakes ore fleet of 255 vessels was cut to less than a dozen still carrying ore Post Strike: The Warehouse Inventory Picture

Product	Inventory
Structurals	Negligible except in isolated areas.
Plates	Negligible. Probably not over 15,000 tons total in U. S. warehouses.
Carbon Bars	About 4-5 months inventory. Going at about 5 pct per month.
Cold-finished Bars	Six months supply on hand.
Galvanized	About 4-5 months supply.
Mechanical and Pressure Tubing	Between 4 and 5 months, inventory with spot shortages in stainless.
Alloys	About 6 months inventory with some receipts during the strike from operating producers. Some shortage in nickel alloys.
Stainless	Four months with some receipts during strike. Spot inventories in nickel-bearing.
Tool Steel	Four months.

during the strike. But no serious ore shortage expected this winter. Boats expected to keep running to end of season, about Dec. 1.

Some mills short of unloading or docking facilities may run short next Spring, but transshipping by rail will be minor.

Prices Rising

Prices . . . Except where competition prevents it, and there are exceptions even here, steel consumers plan to boost their prices to compensate for increased cost of steel.

Makers of steel mill equipment and industrial furnaces figure their costs went up 7-8 pct in last year's wage-price round. Where the competitive situation permits, an 8-9 pct increase in their prices seems likely this year.

Some price boosts have already been made on a contingent basis. Contracts for furnaces, soaking pits, and other engineered installations, often carry escalator clauses. Dravo Corp. estimates that such clauses were 40 pct effective in last year's cost rise.

National Electric Products Corp. shipped on the basis of firm prices up to June 30; after that, sales were based on prices at time of shipment. Rockwell Spring and Axle, in its shipments to passenger car manufacturers, has used partial billing since July 1. It will put through one price increase to cover retroactive labor costs; another to take care of higher steel prices.

Makers of small furnace equipment, brake shoes, materials handling equipment and other competitive items probably will absorb at least part of price boost.

Machine tool builders are certain their prices must go up. Ship and car builders see price boosts as inevitable.

Prices of forgings, fabricated steel, reinforcing steel, castings, some stampings and some fasteners and screw machine products have been climbing over the last 30-45 days, partly due to steel extra increases and partly to new labor contracts within these industries.

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SECOND QUARTER: Earnings Set Records

With good first half recorded, strike over and demand up, it looks like '56 will be a banner year . . . Big Three and other producers hit new highs in earnings and sales . . . Order backlogs are large.

• RECORD SECOND QUARTER earnings and sales announced by the nation's steel producers and the conclusion of the steel strike are casting a rosy glow over prospects for the balance of the year.

The earnings statements do not. of course, reflect the effects of the July strike work-halting. How-, as in the first quarter and in the ever, with demand strike-whetted to fever pitch, the financial picture looks good for the remainder of 1956.

Producers are going ahead with expansion plans. While some delays may be encountered in obtaining materials, they do not appear too threatening.

Demand Is Key

Key to the situation, is demand. As Eugene G. Grace, chairman of Bethlehem Steel Corp., commented in reporting record second quarter earnings, "There's just going to be hell a-popping in the demand for steel."

Bethlehem has orders on hand sufficient for three months of production, he adds, and he forecasts a "full" demand for steel for the rest of the year.

The company reports a net profit of \$50,298,227 for the quarter ending June 30. This was equal, after preferred dividend requirements, to \$5.05 a share on common stock. Second quarter profits in '55 were \$47,006,062. For the six-month period ending June 30, Bethlehem's net profit was \$95,262,014 as compared with \$82,319,324 for the same interval in 1955.

Bethlehem has been booking considerable tonnages of new orders since the strike started, Mr. Grace noted. However, as operations are resumed, the orders booked before the strike occurred will be taken care of first.

He stated that shipments of 3,-905,000 tons of finished steel in the second quarter also set a record. They reflected, he felt, an endeavor to get all the steel possible shipped out before the strike. Bethlehem's production rate was slightly above 100 pct of capacity, about the same second quarter of last year measured by capacity then existing.

U. S. Steel Reports

In similar vein, U.S. Steel Corp. reports it had higher earnings. sales and shipments this year than in any previous first half-year.

Noting that the strike had hindered the normal accumulation of accounting data, Roger M. Blough. U. S. Steel's chairman, estimated the company's net income for the first half at \$208,550,441, equal to \$3.66 a common share. Net for the same period in 1955 was \$177,-877,960. Sales for the first half of '56 were \$2,269,290,135.

U. S. Steel's reported net income for the second quarter of '56 was \$104,389,496. This was slight-

Steel Company Earnings

	Second Quarter 1956	Second Quarter 1955
U. S. Steel	\$104,400,000	\$105,200,000
Bethlehem	50,298,227	47,006,062
Republic	26,491,060	22,944,806
Jones & Laughlin	17,350,000	12,926,000
National Steel	14.858.824	11,829,410
Youngstown Sheet & Tube	11,328,916	10,301,014
Inland Steel	14,944,932	12,987,097
Wheeling	6,119,000	3,763,273
Pittsburgh Steel	2,311,843	1,865,036
Granite City	3,753,021	3,196,409
McLouth	2,578,554	2,026,816
Barium	1,445,043	
Allegheny Ludlum	4,517,971	4,004,748
Detroit Steel	1,963,719	1,610,129
Alan Weed	598,316	622,500
Copperweld	902,099	598,667
Rotary Electric Steel	557,880	1,064,436
Continental	861,761	885,293
Acme Steel	2,008,053	1,851,569
Sharon Steel	2,067,761	2,258,731
Kaiser Steel	7,608,596	5,571,925

ly off record quarterly earnings of \$105,225,558 achieved in the second quarter of 1955.

THE PERSON NAMED OF THE PARTY O

The company spent \$74 million for additions to and replacements of facilities during the second quarter this year, and on June 30 its authorized projects to be completed required a further expenditure of \$634 million, Mr. Blough reported.

The corporation shipped 13,585,-054 tons of steel products in the first half of this year, a record high compared with 12,834,336 tons shipped during the same period in

Costs Up

Mr. Blough sees the new threeyear labor contract as increasing his company's employment costs 7.6 pct in the agreement's first year. In addition, he notes other increased costs during last month for refractory material, steel scrap, heavy electrical equipment, construction work, manganese ore and ferroalloys.

Republic Steel Corp., another member of the Big Three, reported for the three and six-months period ending with June the best sales and earnings for any similar period in its history. Net income for second quarter '56 was \$26,-491,060 or \$1.71 a share, compared with \$22,944,806 or \$1.50 a share for the same period in '55. The company achieved a 20.8 pct rise in sales during the first half of this year.

Jones & Laughlin Steel Corp. announced net income for the quarter ending June 30 of \$17,350,-000, or \$2.66 a share on common stock. In the second quarter of '55 net income was \$12,926,000. J & L net income for the first six months of this year was \$30,909,-000 as compared with \$22,568,000 for the same period in 1955.

No. 1 of a Series

CONVEYORS: Moving Into New Markets

Millions of dollars are lying around in untapped markets waiting to be scooped up . . . Producers have all they can do to keep up with current industrial demands . . . Capital expenditures are increasing.

◆ A MOVING SIDEWALK capable of transporting 10,800 persons an hour through Hudson-Manhattan Terminal at Jersey City. Eight moving ramps that carry sports fans into Wrigley Field at Chicago. A proposed 103-mile conveyor across northern Ohio for hauling ore southbound and coal northbound.

These are forerunners of jobs that lie ahead for the nation's booming conveyor industry.

Markets Neglected

Even though 135 new manufacturers have sprouted up since 1947, the market potential is so extensive that many unexplored avenues are likely to remain untouched for some time.

Conveyor executives, whose hands are busy satisfying the needs of industrial customers, are eyeing with frustration the relatively virgin distribution market—especially terminal and wholesale warehouses. Material handling, still done by manual labor in most warehouses, is ripe for conversion.

Another neglected field is the replacement market. Obsolete conveyors now operating in many older industrial plants are sorely in need of modernization to match efficiency of new production machinery.

New capital expenditures in the conveyor industry, at a record \$10.5 million in 1954, are being stepped up to meet market potential. Sales this year are likely to top \$1 billion. A comparison with previous years shows how the market has grown:

Value of shipments by the industry (including overhead cranes, hoists and monorails) totaled \$248.4 million in 1947, according to the 1954 U.S. Census

of Manufacturers, just released. By 1954, the figure rose to \$479 million and last year it jumped to an estimated \$768 million. If 1956 shipments continue at the pace set in the first six months, \$1 billion is a certainty.

Largely responsible for the phenomenal growth to date is the trend toward automation with its need for more and better material-handling devices. Since 1947, engineering hours within the industry have increased 50 pct in relation to shop hours.

Total employment increased 32 art from 1947 to 1954, but only 28 pct were production workers, reflecting added engineer employment. The industry in 1954 provided work for 32,400.

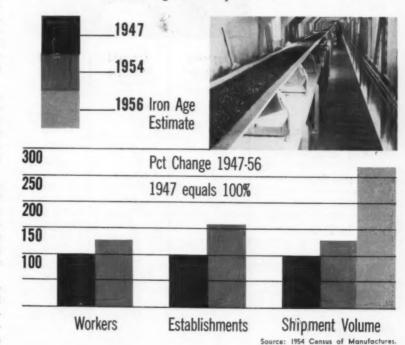
With each new invention in the field of electronic controls, the market for conveyancing devices multiplies.

Improvements in components, such as 5-to-1 reduction in the size of electric motors, use of lighter and stronger metals, development of steel cord belting and better ball bearings, bring added design changes.

Two fields where conveyors are bound to expand soon are (1) the long haul for bulk materials, and (2) the short haul for passengers. The industry is gearing up.

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Charting Conveyor Industries' Growth



84th CONGRESS: How Business Fared

Session had major effect on metalworking . . . Highway program and defense spending significant . . . Government's role in business emphasized in legislation . . . Ike's programs do well—By G. H. Baker.

♦ PRESIDENT EISENHOWER won about half of the new laws he asked of this year's Democrat-controlled Congress. But the session just closed was far from a "do nothing" Congress. It was an aggressive "do something" Congress, with plenty of election-year jousting between Republicans and Democrats in the race to gain favor with the voters.

For business and industry, the two most important new laws are the \$50 billion new coast-to-coast highway program and the \$34.6 billion defense money bill for the new fiscal year that started on July 1. Each of these programs is going to affect metalworking significantly in the next 12 months. Each indicates that the federal government is to be a larger customer of metals and metal products of all types—ranging from rods and structurals for the 41,000-mile road program to high-temperature alloys for new aircraft. What's more, there's no let-

up in buying in sight. For the next 12 months and, indeed, for the next several years, the government will, bit by bit, increase its annual "take" of the nation's total output of metals and fabricated components of all descriptions.

The Congress this year appropriated a thumping \$69,138,077,423 to run all departments of the government through next June 30. Income was slightly higher. Tax reduction was omitted in favor of a small but significant payment on the national debt—the first in many years.

Here's a rundown on key items affecting industry that Congress acted on this year:

Defense Spending Up... Total defense spending in the next 12 months is fixed at \$34,656,727,000 by the Congress. Of this sum, the Air Force gets \$16,459,125,000 (nearly half); the Navy, \$9,999,497,000, and the Army \$7,539,280,000. Service-wide activities take up the balance. The grand total is more than \$500 million above the amount asked by President Eisenhower, which is due mainly to the addition of about \$900 million to buy jet bombers and guided missiles.

Long-range outlook is for small, gradual increases in total defense spending each year. Weapons are getting more expensive as the cost of steel, copper, and aluminum rises and as the Air Force specifies complex electronics equipment in its planes and missiles.

Fewer personnel in uniform are in sight, too. As the science of arms becomes automated, fewer uniformed personnal and more civilians (engineers; technical personnel) are required.

Box Score of Congressional Record



	Approved in House	Approved in Senate	Signed by Ike
Highway Program	V	V	V
No Tax Cut	V	V	
Broadened Social Security	V	V	V
Higher Postal Rates	V.	No	
Private Atomic Aid	V	No	
Natural Gas Decontrol	V	V	Veto
Distress Area Relief	No	V	
Revise Taft-Hartley	No	No	
Defense Production Act	V	V	V
Export Control Act	V	V	1

News Is Harder To Get, Too

Road Building to Boom . . . Congressional approval of the Highway Act of 1956 launches the largest program of new road construction and improvement in history. Nominally pegged at \$32.9 billion over the next 13 years, this undertaking eventually may require outlays of up to \$100 billion in federal and state funds for completion. Backbone of the new program is a 41,000-mile system of interstate superhighways tving together major and medium-sized centers of population and industry. This network will be backed up by a vast number of modern urban and rural roads designed to promote greater commercial and distributive progress.

Merger Notification Postponed . . . Legislative year of 1956 started out as a big antitrust year -concern over the "wave of mergers" and of the pinch on small business ran high - but wound up a dud. After a flurry of investigations by a handful of different congressional committees, the antitrusters settled on a measure requiring firms with over \$10 million in assets to tell the government 90 days before they consummated a planned mergera proposal which did not sit well with most businessmen. The House passed the bill, but it got stuck in the Senate committee.

Atomic Progress Stalemated . . . Congress started out to set some new records in legislating to promote peaceful atomic energy, but found itself tugging in two directions and got nowhere. Republicans, aided by a few coal-district Democrats, blocked the Gore-Holifield bill to put the government into nuclear electric power development to the tune of \$400 million. In retaliation, the Democratic leadership blocked consideration of two Eisenhower must bills which would have helped private atomic development.

Less Government Competition...
The Congress grudgingly permitted termination of its earlier claim that it could veto Administration close-downs of government-industrial operations. Last year, indi-

The Eisenhower Administration's fondness for secrecy in government is spreading. Both Democratic and Republican congressmen are agreed on that point.

Worst offender of the "it's-none-of-your-business" attitude is the Defense Dept. Next worst offender is Commerce. (Ask any Washington editor.)

A House subcommittee examining the drift into secret government urges the Administration to answer questions frankly, except where national security is legitimately concerned.

Most Congressmen agree that while lke personally is completely frank and honest, his lieutenants are not always so.

(Trouble is, bureaucrats maintain that anything embarrassing to their offices involves national security, hence must be withheld from the public.)

vidual congressmen squawked loudly at Administration decisions to withdraw from such commercial-type operations as the making of chain, paint, and rope.

Distressed Area Aid Dies . . . Senate and House both talked loud and long about possible methods of aid to depressed industrial and rural areas, but went home without taking any action. The Senate passed a bill to provide \$225 million in aid and loans to troubled communities, but the House, with only two days left, didn't take action on it.

Social Security Expanded . . . President Eisenhower's signature on the new social security law opens the doors of coverage to about 800,000 women and 250,000 disabled workers each year.

Women, starting in November, can begin drawing benefits at age 62 instead of 65. Payroll taxes will go up next Jan. 1 for 53 million workers, their employers, and for self-employed.

Flood Insurance Coming . . . The new flood insurance plan approved by Congress will (if signed into law by President Eisenhower) authorize the government to either reinsure the flood and disaster policies issued by insurance companies or to insure own-

ers of homes and factories directly. Under the terms of the new plan, the first \$100 in damage is not covered, and the maximum coverage for a home is \$10,000. No person or company can legally hold more than \$250,000 worth of this high-risk insurance.

Finances Finally in the Black... Although the Congress voted a plump \$68.1 billion to run the government for the 12-month period that started July 1, the Treasury said it would collect even more than this peacetime record sum. Government spending in the fiscal year that closed June 30 hit a total of \$66.4 billion, and the Treasury announced that it had gathered in a bit more—\$68.1 billion—to produce the first budget surplus in years.

Steel Probe Delayed . . . A possible investigation into steel industry's price and wage policies by the Senate-House Economic Committee was set for late June or July, but the strike and other factors pushed it back. Now, committee sources say, it will be fall before the committee, headed by Sen. Paul Douglas, D., Ill., gets together again to go over the report of the staff's preliminary investigation and decides whether to go ahead with a headline-hunting probe.

TAXES: High Rates Cut Industry Growth

Pennsylvania's highest in the nation corporate tax is under fire . . . State's industrial expansion lags behind neighbors . . . Ohio's low rate on corporations draws industry—By R. D. Raddant.

IT TAKES more than markets, tric Corp. More than anything materials and labor supply for a state to attract, and even hold, the type of industry that will make it prosper.

atalor fracia winds and received

Some states, particularly Pennsylvania and Massachusetts, are taking a close look at their tax structures. There's cause for alarm that excessive taxes on corporations are driving industry out of the state or holding down vital industrial expansion.

Last week in Pennsylvania, Governor George M. Leader appointed a 14-man bi-partisan committee to draw up a "statesmanlike" financial plan for the state. Most businessmen and many private citizens believe a wholesale revision of the state's tax structure is long overdue.

Start Hearings

At the same time, a joint tax study committee of the Joint State Government Commission opened hearings on tax problems. What they heard was not encouraging.

And it wasn't surprising that the critical statements came from spokesmen for Westinghouse Elecelse, it was disclosure some months ago that the giant electrical company's home state was to get none of the company's future expansion that brought the state's corporation tax under fire.

2" 1 L M 2

Before the commission, L. E. Kust, general tax counsel for Westinghouse, called Pennsylvania "a less and less attractive place to do business."

"In our endeavors to make tax cost comparisons, we have found the most satisfactory standard of comparison is tax cost per dollar of investment," he explained. "This is an especially appropriate standard for support of a decision to make a new investment.

"We have found the Pennsylvania tax cost to be excessive in comparison with other bases when applying that standard. No company can ignore such a factor as taxes in planning new manufacturing facilities."

Mr. Kust told the commission that tax costs in Pennsylvania, including unemployment compensation, are equal to 2.36 pct of investment in tangible personal property. This compares with 1.46 in Ohio, 0.97 in Indiana, and 2.01 in New York.

6 Pct Tax

Without unemployment compensation, costs are 2.07 pct in Pennsylvania, 0.67 in Ohio, 1.51 in New Jersey, and 1.17 in New York, Mr. Kust stated.

The reason for Pennsylvania's high cost for corporations is a six pct tax on corporate net income. The state (in 1954) derived 44 pct of its total tax income directly from corporations. In addition, the state levies a tax of five mills on corporate property.

There's obvious evidence to prove that the state's excessive taxes on corporations is driving out, or keeping out new industry. Of the states adjacent to Pennsylvania, it has had less population expansion and less employment growth than any in the period 1950 through 1954.

Delaware's manufacturing employment has grown 15 pct in that time, Maryland's 14.3; Ohio, 13.7; New Jersey, 9.7; New York, 7; and Pennsylvania, only 5.3 pct.

Massachusetts Loses

Of the 10 largest states in population. Pennsylvania's per cent of increase in employees in manufacturing industries from 1950 to 1955 is 5 pct, placing it eighth out of ten. Massachusetts, which has geographic problems in addition to a high corporate tax rate, actually lost 4 pct.

Although the upsurge of population and industry in California and Texas leads the nation, it is Ohio's rapid industrial growth in recent years that is so irritating to Pennsylvanians.

How States Get Their Tax Revenue

(Pct of Tax Income, 1954)

State	Corporation Tax	Sales Tax	Personal Income Tax	Others
Pennsylvania	44	9	0	47
Massachusetts	31	0	28	41
Wisconsin	26	0	38	36
New York	23	2	39	36
North Carolina	23	28	20	29
Connecticut	20	42	0	38
California	14	50	10	26
New Jersey	11	0	. 0	89
Michigan	9	61	0	30
Illinois	1	58	0	41
U. S. Average	13	33	13	41

Source: Philadelphia Chamber of Commerce

Time and time again, Western Pennsylvania has seen industries locating just across its western border in Ohio, close to Pennsylvania's coal mines and steel production. There they take advantage of the state's resources, but generate wealth and prosperity for Ohio.

Leonard A. Drake, economist of the Philadelphia Chamber of Commerce, recently completed a study of comparative corporation taxes of Ohio and Pennsylvania.

He points out that a study of 54 large Pennsylvania corporations which also had plants in Ohio showed that the corporations were paying the equivalent of 2.26 pct of total net investment in Pennsylvania compared with only 0.14 pct in Ohio. (Basis of figures was a Pennsylvania state tax study in 1953.)

And between 1947 and 1955, number of employees in manufacturing in Ohio has grown 7.3 pct while Pennsylvania's dropped 4.4 pct.

"As a direct consequence," Mr. Drake concludes, "business development in Pennsylvania is lagging seriously behind the rate of industrial and commercial expansion in Ohio, where corporations are tax-favored at the state level."

Competition:

M-H-F enters earth moving, handling field.

Behind the announcement that Massey-Harris-Ferguson is entering the materials handling and earth-moving equipment field is the story of growing diversification in the farm equipment industry.

Built around five tractors, with a number of interchangeable attachments, M-H-F's workbull will be marketed by a newly activated industrial division, will be marketed through 150 to 175 dealers handling the complete package of equipment. There will be no attempt to handle the equipment through the company's existing farm equipment sales organization.

Massey-Harris-Ferguson makes no bones about it, the equipment was designed for the buyer with limited capital.

PISTONS: 201 Makes the Grade

Stainless makes big step in auto field . . . Expander spacers made of type 201 are accepted by major automaker for new models . . . Better oil mileage reported.

◆ STAINLESS steel appears 'to have made a key breakthrough. Automotive piston rings employing type 201 stainless expander-spacers have been developed and tested. A major carmaker says they give better oil mileage than conventional rings.

The new rings were developed by Sealed Power Corp., Muskegon, Mich., working with Allegheny Ludlum Steel Corp. They are oil, rather than compression rings. Stainless is used as the expanderspacer, which keeps the outer iron ring seated against the cylinder wall.

With one car manufacturer lined up to use the rings in new models and with the assemblies due to be offered for replacement use in the second quarter of 1957, Allegheny Ludlum sees a nice market opening up. Moreover, the rings embody two of the company's pet themes.

Big Step

A-L, like other stainless steel producers has been hammering away at the auto industry for some time on the point that stainless should be used in cars for its functional qualities as well as its bright appearance. Until recently, little headway was made: stainless was used primarily in surface applications where it could be seen rather than as an engine or body material for its strength and durability.

Another gratifying aspect of the development is the use of type 201, a low-nickel-content steel. Several stainless producers have been plugging the 200 series as a satisfactory substitute for the high nickel bearing 300 group in many applications. In the ring assemblies, 201 proved to be not "just as good" as 301, but better.

The high nickel steel was tried originally by Sealed Power but was discarded in favor of 201 because the latter retained tensile strength over a longer period and has a harder surface.

The Advantages

Advantages cited for the new type rings are that they can be made to precise specifications and that they hold up well under operating conditions. The 201 steel needs only a low temperature stress relieving operation. It gets its spring properties from forming operations and is free of warpage.

Under operating conditions, the new rings are reported to retain about 2 lb more tension than comparable carbon sets. It is said that they don't pick up sludge, have less of a tendency to plug oil holes, have been tested for 450,000 miles without breaking.

According to tests by a car manufacturer, these qualities add up to oil consumption of "considerably better than 1000 miles per quart of oil." Other auto makers are likely to try it out.

Marching to Georgia

Westinghouse Electric Corp., Pittsburgh will build a new distribution transformer plant in Athens, Ga. The new facility will be part of Westinghouse's Transformer Div., headquartered in Sharon, Pa.

The Georgia installation is expected to double the output of the division.

New building will contain about 750,000 sq ft of which 633,000 will be devoted to manufacturing. Capacity operation is not expected until 1960, but actual production will begin in mid-1958.

THE IRON AGE INTERVIEWS:

Nathanael V. Davis

Outlook For Canadian Aluminum

Aluminium Ltd. capacity expected to hit 1 million tons by 1960 . . . 40 pct of 1956 output to be sold in U.S. . . . Sales pitch aimed at the independent fabricators.

- Q. How much aluminum will your company produce in Canada this year?
- A. About 600,000 tons. Unfortunately production in some of our plants was curtailed earlier in the year by a shortage of water for power. We expect to run at near capacity for the rest of 1956.
- Q. About how much output did this shortage cost Aluminum Ltd.?
- A. Roughly 90,000 tons.
- Q. Did this shortage of water for hydroelectric power cause you to consider the possibilities of other sources of power, like coal?
- A. No. This year was the second worst in 40 years—and there wasn't much difference between it and the worst. We certainly hope, and reasonably anticipate no reoccurrence of such a serious situation in the foreseeable future.
- Q. How much of your output finds its way to U. S. customers?
- A. In 1956, about 250,000 tons will be sold to customers in the U. S.
- Q. Who buys your aluminum in this country.
- A. Aluminum Ltd. aims to sell to the independent fabricators in the U. S. market. Of course we do have substantial contracts with Alcoa and Kaiser, but this is for a specified amount.
- Q. Is there an advantage to selling to non-integrated fabricators?
- A. Definitely. We believe the in-

- dependent fabricators look upon us as a natural supplier. We on our part look to them as steady buyers in both good times and bad, in comparison with those who produce their own ingot requirements.
- Q. Is the U. S. market now getting a bigger share of Canadian aluminum?
- A. Yes. This year it will be about 40 pct of our output. Over the last five years it has averaged about 30 pct.
- Q. Can the independent fabricator in the U. S. count on always getting aluminum from this source?
- A. We have to sell aluminum ingot to stay in business. Although it is true our fabricating is increasing, our output of primary metal is growing at a much faster rate. We anticipate that more rather than less aluminum will be available to independent U. S. fabricators over a period of time.
- Q. Just how much more?
- A. We can't really be sure, of course. However, our current plans call for a continuous increase in our capacity to well over 1 million tons by 1960. It could mean a considerable increase in aluminum sold to independent U. S. fabricators.
- Q. Do you anticipate any halted production because of labor trouble?
- A. No. Our workers are represented by three major unions; a French Canadian group, a CIO group and an AFL group. Re-



♦ Nathanael V. Davis is president of Aluminium Ltd., Canada, the free world's second largest producer of primary aluminum. His company's annual capacity is presently 732,000 tons in Canada alone.

'One of Mr. Davis' most noteworthy accomplishments is the conception and completion of a huge expansion program, highlighted by the construction of the Kitimat installation.

With demand in the U.S. well in excess of domestic production, the amount of aluminum which crosses the border from Canada is a pivotal supply.

This IRON AGE interview reflects the thinking of Aluminium Ltd.'s top man on current conditions and future outlook.

lations between the company and the unions have been cordial.

- Q. What is your opinion of the future of the aluminum industry?
- A. We are betting over \$500 million that it is very bright. That amount has been authorized to be spent from the beginning of this year to 1959 for expanding and developing our facilities. And we are thinking even further into the future. By 1960 Kitimat will have a capacity of about 330,000 tons. But our engineers have already drawn up plans by which capacity could be increased to as much as 550,000 tons.



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Tax-Am: Everyone's getting

into the act

Three separate groups of tax and mobilization economists are now conducting studies which will result in recommendations on the future of fast writeoffs.

Latest to join the study party is the staff of the Senate Finance Committee. Sen. Harry Byrd, D., Va., wants his committee employees to collect facts and figures showing the operation of the "tax-am" program and come up with conclusions as to the need for its continuance.

If the staff study follows the inclinations of Sen. Byrd, and also Treasury Secretary Humphrey, it will recommend that the program be drastically curtailed—if not abandoned.

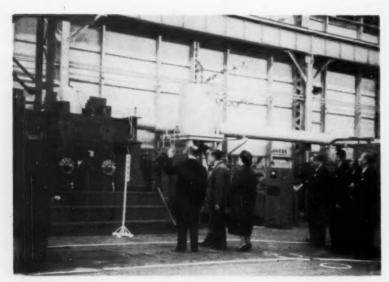
From a high of 224 expansion goals for which tax amortization was at one time available, only 32 goals are still open. Office of Defense Mobilization, which runs the program, is a supporter of the program, but has not made an issue of opposing Humphrey or other administration officials who are mildly antagonistic to its use in peacetime.

ODM has ordered a review of three closed goals in the steel industry—heavy plate, pipe, and structurals.

American In Puerto Rico

American Can Co. will build a \$1 million plant in Puerto Rico with a capacity of 150 million cans per year. Work on the new plant will begin late this summer or early fall, with production expected to begin in 1957.

The actual building will be done by the Puerto Rican Industrial Development Administration, with American Can equipping and operating the plant under a 10 year self amortizing lease.



JAPANESE EMPORER HIROHITO and Empress listen to an official of Toyo Kohan Co., Ltd., explain operation of a new Ferrostan tinning line. Equipment was designed and installed by Wean Engineering Co., Warren, O.

Expansion Briefs

Perfect Circle Corp., Hagerstown, Ind.; new building to be used as a distribution center; cost about \$1 million.

The Stanley Works, New Britain, Conn., manufacturer of steel strapping; started construction on a new plant to double output.

Armco Steel Corp., Middletown, O.; new openhearth furnace will boost output by 9 pct; cost about \$2 million.

Pittsburgh Steel Co., Pittsburgh; will begin installation of a new 30-in. billet mill in December at Monessen, Pa., works; cost about \$6 million.

Alter Co., Davenport, Iowa; manufacturer of secondary nickel alloys; purchased physical assets of Davenport Besler Corp.

LeTourneau-Westinghouse Co., Peoria, Ill.; manufacturer of earth-moving and material handling equipment; new building and tooling program; cost about \$9 million.

Foote Mineral Co., Philadelphia; improvements on Kings Mountain plant; cost about \$600,-000.

Thermo Materials, Inc., San Francisco; new firm formed to develop and produce precision high temperature industrial ceramics.

Aerojet-General Corp., Azusa, Calif.; new building for the engineering dept.; cost about \$900,000.

Hyster Co., Portland, Ore.; materials handling manufacturer; will build a new manufacturing plant at Sao Paulo, Brazil.

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engineered machinery of every description.

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LEFT FOREGROUND - Con veyor table for rad or tube

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IRON AGE

REPORT TO MANAGEMENT

It's Never too Early to Hope

Although you didn't get the tax cuts you probably hoped for this year, the Treasury Dept. is already hinting that next year will be the year. It's something like a second place baseball team at the end of the season.

Manager George M. Humphrey points with no little pride to the balanced budget, a big improvement over the previous season and a record of continuous improvement since he took over managing the Treasury team.

But to placate the critics who contend that this isn't quite good enough, that the balanced budget also should have resulted in a tax cut, the "wait until next season" tactic is adopted.

Although Congress voted \$68.1 billion for the next fiscal year, Mr. Humphrey now implies that if the boom continues, tax receipts should exceed that figure by enough to result in tax cuts next year, equivalent to a Worlds Series victory. Of course, he wants to be around to see it accomplished.

The \$68.1 billion appropriated by Congress is just about equal to tax receipts of the fiscal year ended June 30. While the steel strike may take some edge off anticipated tax receipts, an upsurge in automotive and others this year should compensate.

Government's Business Role Widens

You may have watched the 84th Congress come and go with a feeling that it left business pretty much alone for a change.

In fact, it made several gestures in that direction—such as giving the Administration authority to drop out of competing industry-type operations, refusal to consider repeal or revision of Taft-Hartley, or to take strong anti-merger or monopoly measures.

But that would lead to the

wrong conclusion. The government is still very much a factor to business and industry. Some of the scores of laws and actions of Congress that affected business and industry are outlined in report on Congress (P. 40), but the list is far too long for complete coverage.

It's wise to remember that of \$68 billion appropriated by Congress, \$34.6 billion will go to defense—that more than \$32 billion will be spent over a 13-year period on the new highway program, with total expenditures of all governmental units running upwards of \$100 billion for the road program.

Government's importance to business is not going to lessen for some time, if ever. Its budget total alone assures that, even at a time when tendency to interfere with actual business operations may be on the downgrade.

What's Happening in Prices?

Here and there are signs that makers of consumers goods won't be able to hold price lines as much as might be hoped.

In spite of competition

in many fields, some prices were inching up even before the effects of a steel price hike were realized. Some major appliance makers made moves to boost prices with the anticipated steel price rise listed as "just one factor."

Auto dealers, despite big inventories and a fast fading 1956 model season, aren't frantically cutting prices or boosting trade-in values. A big talking point is that higher prices are just around the corner. Whether that will be enough to accomplish the cleanup remains to be seen.

The government is watching price levels closely, could step in if things get out of hand. But best bet is that it will let the economy alone until after elections. One exception—a probable relaxing of down payments on new homes to boost the lagging new home market.

INDUSTRIAL

Hideaway Heat Pump . . . A heat pump designed for garden installation and remotely controlled from a separate unit inside the home has been developed by Westinghouse Electric Corp., Staunton, Va. The two-package unit is planned for homes with no basements, small utility rooms or insufficient attic space.

Good Covering . . . Aluminum Industries, Inc., Cincinnati, has formed a new subsidiary, Permite Products Co., Modesto, Calif., to distribute Permite aluminum paints in eight western states and British Columbia.

Rip or Crosscut . . . A stainless steel, rust-proof hand saw has been developed by the Atkins Saw Div. of Borg-Warner Corp. The Atkins No. 500 has a diamond polish designed to catch the natural highlights of stainless steel, a choice of Butyrate plastic or 11-ply waterproof marine plywood handles, and a handy hang-uphole in the end of the blade.

Alleghenies to Sierras . . . Allegheny Ludlum Steel Corp. has contracted to purchase Paul R. Repath, Inc., of Los Angeles. Calif., producer of electrical steel laminations, metal stampings, and deep drawn transformer cans. Allegheny Ludlum's wholly owned subsidiary, The Arnold Engineering Co., specializing in magnetic materials, will operate this plant as Repath Pacific Div. of The Arnold Engineering Co.

Gray Iron Markets . . . A new marketing committee of Gray Iron Founders' Society has been formed to help members improve marketing practices and enlarge overall gray iron casting markets. Marketing, says GIFS executive vice-president D. K. Workman, is not keeping pace with technological advances in this field.

That's Diversification . . . The New York Air Brake Co. has acquired the Optical Film Engineering Co. of Philadelphia. Optical Film Engineering Co. will be operated as the Vacuum Equipment 'Div. of The New York Air Brake Co.

Delivery Room . . . Sharply increased sales of industrial lift trucks during the first two quarters of 1956 have necessitated the creation of a separate Delivery-Order Entry and Scheduling Department in The Yale & Towne Manufacturing Co., Philadelphia.

Back to School . . . A series of eight Management Training Programs for early fall will be given by the National Institute of Management, Inc., beginning September 24th through October 22nd. Training programs include courses in work measurement, standard data, production control and inventory management, methods improvement, operations research, production and sales forepredetermined time casting, standards and mathematical programming.



"There's some awfully odd 'casting' going on back there!"

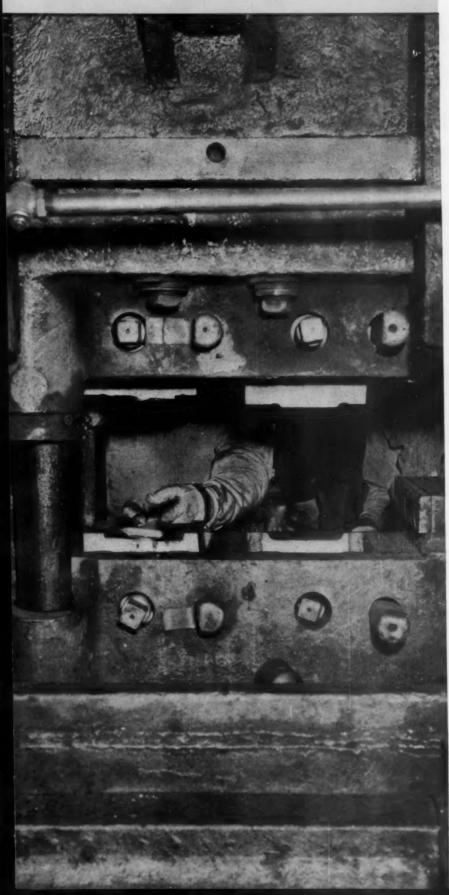
One More for Porter . . . Electric Service Manufacturing Co., Philadelphia, manufacturers of electrical equipment for the utility and transportation industries and for heavy industrial plants, has been acquired by H. K. Porter Co., Inc.

Long Ride . . . Hewitt-Robins, Inc., has received a contract amounting to more than \$1 million for a conveyor system to be installed in U. S. Steel Corporation's new ore screening and sintering plant at Youngstown, O. The conveyor system will consist of 40 separate units totaling more than 7,000 ft in length. Installation will be completed in 1957.

Up and Over . . . Allis-Chalmers Manufacturing Co., and the Aviation Gas Turbine Div. of General Electric Co. have signed a multimillion dollar contract for the manufacture of jet engine assemblies. The contract calls for the manufacture of compressor rotors for the J-79 turbojet engine at Allis - Chalmers Terre Haute Works.

Talk About Power! . . . The 19th annual American Power Conference, sponsored by Illinois Institute of Technology in cooperation with 14 universities and nine technical societies, will be held at the Hotel Sherman, Chicago, on March 27-29, 1957.

Call up the Reserves . . . Joseph P. Crosby, former president of American Society of Tool Engineers has been designated by the Secretary of Commerce, as one of 83 executive employees of private industry to be a member of the National Defense Executive Reserve established by the President Feb. 15, 1956. This group will serve with the BDSA of the Dept. of Commerce in event of a future mobilization emergency.



Colloidal Graphite saves *25,000 a year on jet-blade forging

In the close-limit forging of a jet-turbine blade, a prominent manufacturer found that by using 'dag' Colloidal Graphite on the dies, only one blow was needed to go from upset billet to final blade shape. Besides eliminating the second hammer-blow previously required, intermediate descaling and reheating operations were also avoided...for a total yearly saving of some \$25,000 on this single operation.

Both oil-based and water-based 'dag' Colloidal Graphite dispersions are widely used in forging operations. Diluted and sprayed on the dies, the colloidal graphite forms a slick lubricating film...protects the expensive dies and improves metal flow during forging.

Pretreatment of new dies with 'Aquadag' — colloidal graphite dispersed in water — has paid off handsomely, too. Some firms estimate a 50% greater usable life from forging dies given this protective film of colloidal graphite before being put into service.

The benefits of 'dag' dispersions for forging and other metalworking applications are discussed in Bulletin 426. Ask for your free copy.





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How Much Will 1957 Cars Cost?

With steel prices going up and retooling costs high, it is the big question in Detroit today . . . Ford, the first model to unveil next month, will set the pace . . . Market shows healthy signs—By T. L. Carry.

♦ THE TOUCHIEST QUESTION in Detroit right now is "How much are the 1957 cars going to cost?"

Settlement of the steel strike brings with it certain knowledge that there will be a sizeable increase in the price of steel and a corresponding hike in the cost of everything that is made with the basic metal.

Manufacturers always hesitate when it comes to stating specifically how much bigger the price tag will be on a car.

All Eyes On Ford . . . This is particularly true of the producer that brings his car out first. He is in the position of setting the competitive pace regarding prices and, if he makes a bad guess, he either retracts quickly or suffers the consequences.

If his price is too high, he must lower it. If it is too low, he is subject to criticism when he raises it.

This year, Ford Motor Co. will be first to announce its new models and so is in the position where it must set its prices and do it properly the first time. Chances are the new prices will be competitive because Ford's costs for producing cars will be very similar to those of other automakers.

Price Estimating Tricky . . . As in any other business, the bigger volume a producer has the cheaper he can price his products.

No automaker can put an honest price on the first car to roll off the assembly line. It would be impossible for anybody to buy the vehicle because of the huge costs involved in tooling up for production.

So a producer bases the price of his car on the assumption that a certain number will be made. Here is how the gamble works:

Say a company knows how much it will cost to make 1 million cars. The price of the first car is based on the actual cost of producing the millionth vehicle. Then the company hopes it will be able to reach the expected volume and make a profit in the process.

Suppliers Up Prices . . . As far as next year's cars are concerned, let's assume that the price of steel goes up \$12 per ton. If 3000 lb of the metal is used in making one vehicle, that increases the manufacturing cost at least \$18 per unit, not counting the amount of steel that is scrapped during the



". . . and if for any reason you are not satisfied, simply bring your complaint to the nearest Italian consulate . . ."

manufacturing process.

At the same time, the manufacturer is going to have to pay more for parts he buys from outside sources. This is reflected not only in the increased cost of steel but also the supplier's labor costs.

A recent announcement by B. F. Goodrich Co. regarding an increase in the price of its tires indicates that this item will also go up in price next year.

Add to this the manufacturer's own basic labor costs and other overhead expenditures and you come up with a sizeable package.

Healthy Outlook ... But this is only the beginning. It might be possible to absorb some of the above costs if it were not for the fact that a lot of major changes are being made for 1957. Producers have laid out a lot of money for new tools, dies and fixtures and they have to amortize the cost.

The result will be a healthy increase in the price of 1957 models. Some observers believe that prices will go up anywhere from \$50 to \$150 depending on the make.

Two other facts are certain regarding the increases to come. Cleaning up the old models isn't going to be any problem. And the used car market, which has been exceptionally strong this year, will stay healthy well into 1957.

Waste Control Test

Ford Motor Co. reports some encouraging results with an experimental bacteria farm it has installed at its coke ovens for the control of industrial waste.

The company has installed a

You're Looking For Trouble

if you buy on price alone



"Like many other firms," says Mr. A. Balas, Equipment Engineer at Mergenthaler Linotype Co., N.Y.C., "we are constantly on the alert for new equipment, new processes and new ideas. This constant search for improvement convinced us of the need to purchase a versatile, time-saving, cost-saving and, above all, accurate Horizontal Boring Machine. We checked them all — feature for feature — and then bought the Bullard H.B.M., Model 75. We feel it has enough "built in reserves" to take care of any contingency or new development which may come up. It's reassuring to know that an investment of this size won't go out of style next month."

Why don't you get the full story on the many features and advantages offered you with a Bullard H.B.M., Model 75 in your plant. For a complete line catalog, just call your nearest Bullard Sales Office, Distributor or write

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Automotive Production

(U. S. and Canada Combined)

WEEK	ENI	DING	CARS	TRUCKS
AUG.	4,	1956	117,608	22,868
JULY	28,	1956	120,416	23,587
AUG.	6,	1955	146,813	23,191
JULY	30,	1955	171,465	28,295

*Estimated. Source: Ward's Reports

filter for the study of bacteria which eat phenol, or carbolic acid, contained in waste water from the production of coke.

The company uses bacteria present in all untreated water used for industrial purposes and which, Ford says, have a huge appetite for phenol.

The experimental unit consists of a 30-ft tower which is filled with hundreds of corrugated plastic strips. The waste water trickles down through the tower and the bacteria cling to the strips and thrive under controlled conditions.

By eating the phenol and certain phosphates that are added to the water, the bacteria form a thick covering on the plastic strips.

The present unit is being used to study the amounts of phenol that can be removed from the water and the practicality of building a larger facility.

The project is being conducted by the company's Steel Div. and Plant Engineering office.

At least two other methods of treating industrial waste are also under study but they have not progressed to the point where the company feels that definite statements can be made about the results.

AUTO CLOCKS:

Lack of oil, not vibration the big problem.

Chances are that when your car was new its clock kept time beautifully but later began to either lose or gain time, depending on the weather.

Auto clocks are almost a standing joke in the industry. After a given period, clock mechanisms become faulty and the clock either stops completely or fails to keep accurate time.

Actually, there is no difference between auto clocks and any other type of timepiece. Most automobile clocks are mechanical and have an electric winding device. It is the use to which auto clocks are put which makes them different from other types.

Wrist watches, for example, are accurate because they are next to the body and thus are kept at a relatively constant temperature. Electric house clocks keep good time, not because they are any better but because utility companies deliver current to them at a constant rate.

Vibration of a car has nothing to do with the proper operation of a clock. Auto clocks are designed to take all kinds of bumps. Proof of the pudding is the tests which automakers use for clocks. These timepieces are picked at random and alternately subject to vibration tests and extreme cold and high temperature tests.

Tests have shown that the two things that effect the proper operation of a clock are temperature and the condition of lubricating oils.

AUTOMOTIVE NEWS

The two problems are related. Changes in temperature effect the oils used to lubricate the clock. Perhaps you have noticed that your auto clock often runs better in summer than it does in winter.

The solution to the problem is regular maintenance.

Power Features Pull

An indication of the increasing popularity of power features on automobiles is reflected in statistics just released by Oldsmobile.

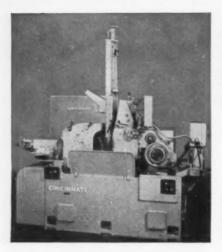
Power brakes lead the field and have been installed in 69 pct of all the Oldsmobiles produced from January to June this year. Power steering runs a close second and accounts for 59 pct of the total.

In addition the demand for the new Hydra-Matic transmission introduced by General Motors this year is growing by leaps and bounds. The unit has grown so popular that Oldsmobile reports installing it in 99 pct of all the cars it produced during the first 6 months of this year.

THE BULL OF THE WOODS

By J. R. Williams







Universal joint spiders. An ingenious loading device transfers the parts from one pair of wheels to the next. Four diameters are automatically ground each cycle. CINCINNATI® FILMATIC No. 2 Centerless Grinder.







Pump shafts. A magazine type work loading fixture and automatic infeed attachment help to reduce the cost of grinding bearing grooves. CINCINNATI FILMATIC No. 2 Centerless Grinder.



... and Cincinnati Centerless Automation can reduce costs in your shop, too

Centerless grinding is a "natural" for automation. It can be developed to any degree required for your production, from a simple feed cycle to a complete line. Cincinnati Centerless grinding specialists have been doing this type of work for 33 years. That's one reason why it will pay you to consider Cincinnati first. Only Cincinnati can give you the advantage of long experience and a choice of six sizes of centerless grinders. May we hear from you?

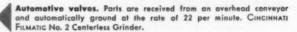
CINCINNATI GRINDERS INCORPORATED
CINCINNATI 9, OHIO



Rocker arm shafts are loaded into the hopper at the left and transferred by conveyor from one CINCINNATI FILMATIC No. 2 Centerless to the next, and finally through the CINCINNATI FILMATIC Centerless Lapper at the far right.







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Rising Prices Have White House Worried

Election year makes it necessary to keep signs of inflation from getting out of hand... Both parties are aware that "synthetic" prosperity may result... Legal and persuasive methods used—By G. H. Baker.

♦ THE NEW ROUND of inflation that's building up is causing some frowns and furrowed brows around the White House. Ike's economists are now resigned to the fact that a certain amount of inflation—a lot of it resulting from the steel strike—is inevitable.

The political problem now at hand: How to control the rising cost and price pressures now at hand—how to keep them from getting too far out of hand—particularly between now and the November elections.

Politicians in both parties are well aware that inflation, if carefully controlled by government, can produce a synthetic type of prosperity that is appealing to voters who don't think too far ahead (Former President Truman once stirred up the wrath of those who live on fixed incomes by remarking that "a little inflation never hurt anybody").

When a major wage increase is put into effect, all the wheels of the national economy begin to spin a little faster. Workers, earning more, begin to think in terms of prosperity, although the price of goods and services they buy also rises.

What Washington is now trying to accomplish is to use both laws and persuasion on businessmen in an all-out effort to prevent (or at least slow up) the rises in costs.

Inspection a Must

Top-ranking Pentagon officials are making it clear that the Eisenhower Administration will never agree to any substantial cuts in the U. S. defense program if the Soviets do not permit personal inspections to see if they are keeping their word.

And our military men emphasize that "personal inspection" does not mean just casual looking around at sites suggested by the Russians. Likewise, we will not be satisfied by peering at serial photographs of the U.S.S.R. land-scape.

Until a method is found of detecting hidden stockpiles of atomic weapons, any disarmament policy would be sheer folly. And our top military men say they know of no method to detect hidden nuclear stockpiles.

Says Secretary of the Air Force Donald A. Quarles:

"An effective inspection system must precede disarmament, so that each side can be certain the other is acting in good faith."

Almost nobody in the Pentagon has much faith in the recent Russian announcement concerning the reduction of the U.S.S.R. armed forces by "more than 1 million men." All this means, the military chiefs point out, is that the Russians are reaching the same conclusion the United States reached several years ago—that modern technology and atomic weapons have changed military values.

Steel Report Coming

A Bureau of Labor Statistics report on labor productivity changes in the steel industry—withheld during the steel strike—is being prepared for publication by the U. S. Labor Department, an official says.

The report, believed to show that increases in steel labor productivity have not kept pace with wage increases since the end of World War II, has been seen by some steel industry and union officials, and some congressional committees.

How Powerful Is the Atomic Cannon?

In a rare burst of frankness, the Army has opened its secret book to some extent on performance of the death-dealing capabilities of the atomic cannon. Here's what it will do:

- One shell from the atomic cannon will kill at least half of the persons exposed up to about half a mile from the point of the burst. Remaining victims will be badly burned (third degree.)
- Shells can be lobbed about 20 miles.
- Each shell carries the equivalent of 20,000 tons of high explosives.
- Burst of each shell will produce thermal radiation as well as gamma radiation.

MORE FACTS on why more and more leading manufacturers choose Link-Belt bearings







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CHOICE OF SEALS. Left, contact-type felt seals for grease lubrication and dirty conditions—right, spiral labyrinth steel seals for oil or grease lubrication and heat conditions

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What's Behind Boom in Electronics?

One new plant opens every week . . . Area's competition with eastern producers growing . . . West's pool of engineers, skilled labor, and research firms give it edge . . . Component makers wanted—By R. R. Kay.

◆ EVERY SEVEN DAYS a new electronics firm establishes itself on the West Coast. And it's been like this since 1947. Vital statistics: 531 manufacturing plants make 172 products. Some 72,000 employees pick up a \$300 million annual paycheck.

Forecast: Keener competition is in store for electronics producers east of the Rockies. And on their home grounds, too. Companies here are constantly bringing out new and improved products. They're razor-sharp with marketing know-how, and extremely style and quality conscious. Another plus is in the high value per pound of products. It tends to take the curse off the stiff West-East freight rates.

The Reasons Why... The industry here is headed just one way—upward. What's so special about it? What will push it ahead?

1. A vast brainpower pool—more scientists and engineers per capita than any other U. S. area. And there's a steady supply from top-notch local schools.

Availability of skilled labor, trained in the industry.

3. Research and development firms—some 250 of them—plus 55 in testing alone, give the area a big boost. Add to these important U. S. Army Ordnance, Air Force, and Naval testing stations.

Metals They Buy . . . As the industry blossoms in southern California, so does its own home market, the Electronics Committee of the Los Angeles Chamber

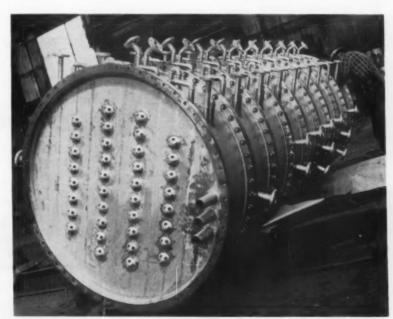
of Commerce reports. Widely diversified industries now here are a constant challenge to the designers and engineers. They're after still bigger sales in the aircraft industry, apparel, broadcasting, communications, food, fishing, furniture, machinery, ordnance, petroleum, scientific instruments, steel, stone-clay-glass, utilities.

And here's where metalworking comes in. Electronics manufacturers buy aluminum sheet, berylium copper, cold-rolled steel sheets in 16, 18, and 20 gage and aluminum castings. They're also heavy buyers of sheet metal tools,

diecasting dies, and a host of other products.

Component Makers Needed . . . But there's a shortage of electronics components makers in southern California. Any competent manufacturer can set up shop and do well and an on-the-spot producer will share in a \$25 million-plus market.

End-product makers now spend the \$25 million outside the area for critically needed items alone. Sixty-five per cent of all components used are brought in from manufacturers in Eastern states.



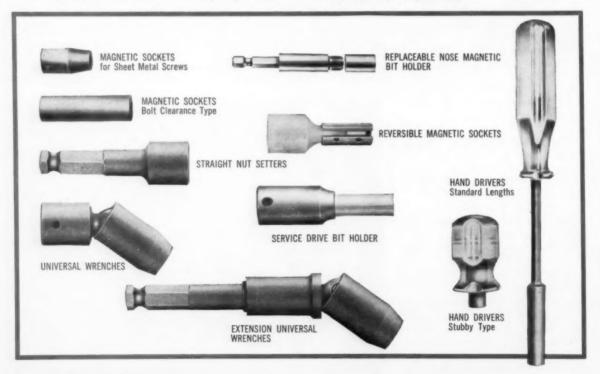
IT LOOKS LIKE A PIPEFITTER'S NIGHTMARE and it is. Thirty thousand stainless steel parts went into this 38-foot absorber tower built by U. S. Steel's Consolidated Western Steel Div. for atomic energy research.

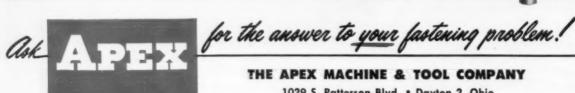
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COSTS

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British Bogged Down with Backlogs

English machine tool builders mired in year's worth of unfilled orders . . . They're forced to turn down needed export business . . . Metalworking plants import tools . . . Builders have manpower troubles—By E. J. Egan, Jr.

◆ BRITISH machine tool industry is backlogged a year or more with unfilled orders. Their slow delivery situation hurts the nation and the industry two ways: (1) it forces builders to turn down much-needed export business, and (2) it compels British metalworking plants to import tools they'd prefer to buy at home.

Like their U. S. counterparts, British builders went through a slump after World War II. They revived to peak production (with help from subcontractors) during the Korean emergency, but they didn't expect demand to stay strong after the shooting stopped. Surprisingly enough, it did.

Expected the Worst...A handful of British builders came to think this new level of post-Korean activity might remain steady, decided to expand their operations accordingly. But most of the smaller firms kept waiting for the customary between-wars doldrums.

There is some evidence that worldwide machine tool demand might remain at healthy levels as long as peace prevails. More and more British builders would like to cater to the trend, but they find that expansion isn't easy.

Workers Wanted . . . Big rub is that the industry needs competent engineers, designers and apprentices who are willing to stick with their jobs. Right now every other industry needs the same types of personnel. Another rough hurdle: British builders aren't

particularly noted for paying top wages and salaries.

Rough as it may be, it seems that more and better workers and bigger paychecks is the only way out. The goal appears worthwhile, too.

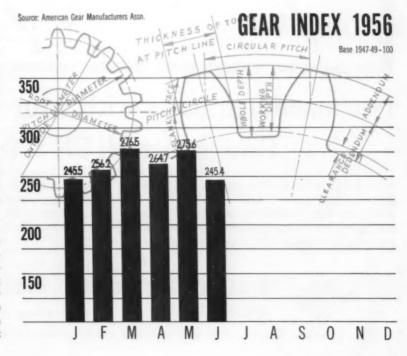
One American, returning from the recent International Machine Tool Exhibition in London, puts it this way: "British builders make some top equipment, by anybody's standards. If they'd light the fire and get going, they could accomplish more than they realize."

Meanwhile at Home . . . U. S. builders apparently intend to keep

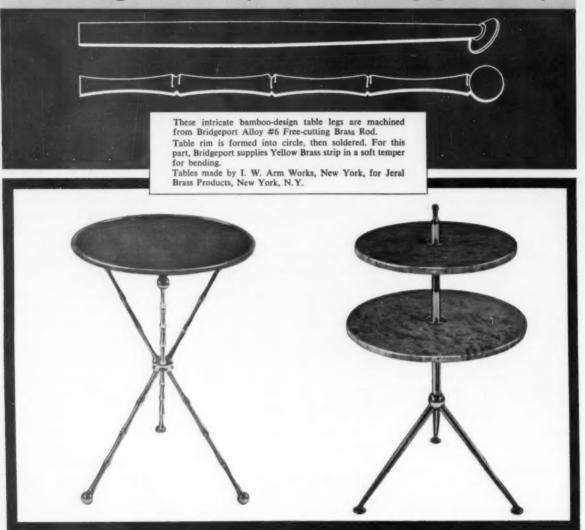
up the full head of steam they generated at their big show in Chicago last September. As evidence, Jones & Lamson Machine Co. will run demonstrations of a new tape-controlled drill press at its Springfield, Vt., plant.

Firm will team up an improved version of its tape-controlled turret lathe with the drill press to show the type of integration possible with programmed machine tools. Demonstration will produce stock parts of varying dimensions, but with only the punched tapes being changed.

Plans are underway to equip a third type of machine in like manner.



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to match the right metal to your product or design. For brass, copper or aluminum, call or write your Bridgeport Sales Office today. They'll also be glad to arrange for Bridgeport Technical Service on your metals and methods.

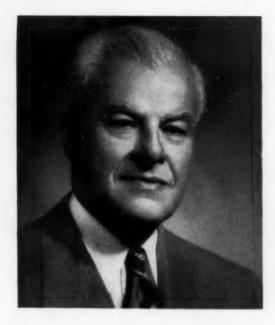
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The Iron Age

SALUTES

Roy C. Ingersoll

Chairman of the board of Borg-Warner Corp., he has been tackling tough administrative problems since graduating from Knox College in 1913.

A sound diversification program is one of his latest achievements.

At 65, when most corporate executives talk of retiring, Roy C. Ingersoll, chief executive of Borg-Warner Corp., was just getting his second wind. Two projects that would have thrown many a younger man were shouldered by him and carried out with remarkable success. When he took over the presidency of Borg-Warner in 1950, the company faced a double-barreled problem; markets and manpower. Both needed immediate attention.

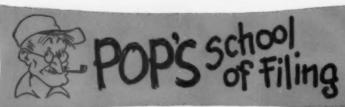
Mr. Ingersoll foresaw that the company could not expect to flourish and expand indefinitely in its traditional markets—home appliances, automotive, and farm machinery parts. Diversification was urgently needed. In the relatively short span of a few years, Roy Ingersoll acquired a number of companies producing oil well tools, pumps, electronic instruments, rubber goods, cranes, hoists and other products. Thanks to him, diversification is no longer a problem at Borg-Warner.

The company's manpower problem involved a

shortage of young men with qualifications to take over duties of older executives. Realizing that many another company caught in such a predicament lost lots of ground, competitively, Mr. Ingersoll outlined a program which he called "Building Management in Depth." It succeeded in building for Borg-Warner a reservoir of capable junior executives.

Although these problems were among the toughest of his career, Roy Ingersoll is by no means an administrative Johnny-come-lately. He played an important part in guiding Borg-Warner through the tough depression years. Born in Sandoval, Ill., in 1884, he is an alumnus of Knox College. He served as vice president of Coulter Disc Co. from 1913 until it merged with Borg-Warner in 1929.

When friends marvel at his energy and ask him when he plans to "take it easy," Roy Ingersoll replies with his characteristic smile: "All my friends who slowed down are no longer with us."







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The Iron Age INTRODUCES

George H. Rehling, appointed vice president, Wyckoff Steel Co., Dayton, O.

Kenneth H. Hannan, elected executive vice president, Union Carbide and Carbon Corp., New York.

E. A. Williams, appointed vice president and general manager, H. W. Loud Machine Works, Inc., Pomona, Calif.

Thomas J. Riggs, Jr., elected executive vice president and general manager, The Gabriel Co., Cleveland.

E. D. Wilgus, elected vice president and general manager, Aviation Developments Inc., Burbank, Calif.

William M. Nave, named consultant, manufacturing organization and shop operations, manufacturing services, General Electric Co., Schenectady, N. Y.

Wayne L. Besselman, named coordinator, technical employment, Leeds & Northrup Co., Philadelphia.

Walter S. Maranuk, appointed manager, Pittsburgh sales and service branch, The Yale & Towne Mfg. Co., Philadelphia.

J. Donald Judge, named director, research and engineering, The Hamilton Foundry & Machine Co., Hamilton, O.

Carl W. Millson, Jr., named vice president, air conditioning, heating and appliance sales, Perfection Industries, Div. of Hupp Corp., Cleveland; Donald G. Wright, named general sales manager, contract sales.

Fred W. Boynton, named industrial products sales manager, Great Lakes, Reynolds Metals Co., Detroit; Auzville Jackson, Jr., named as patent counsel, Legal Dept., Louisville area.

D. W. A. Pleasanton, appointed export manager, Allen-Bradley Co., New York.

William B. Main, named aircraft service manager, Western region, Vickers Inc., El Segundo, Calif.

Richard Schoenfeld, named administrative assistant, Lindberg Engineering Co., Chicago.

O. S. Laing, appointed district manager, Omaha-Denver-Twin Cities, Transportation Products Sales Dept., Stran-Steel Corp., Minneapolis, Minn.

Following appointments are within the Accounting Dept. of Jones & Laughlin Steel Corp., Pittsburgh: Charles R. Miller, named director, works accounting; Walter L. Moore, named asst. chief accountant, general accounting; John R. Fleming, named asst. chief accountant, mill accounting; Allen M. Motter, named supervisor, Systems and Procedures Div.



ELLIS A. TRAUTMAN, appointed general manager, New Castle plant, Mesta Machine Co., Pittsburgh.



LEONARD F. QUINN, named manufacturing manager, New Castle plant, Mesta Machine Co., Pittsburgh.



ROBERT E. WILLIAMS, appointed director, distribution and availability, U. S. Steel Corp., Pittsburgh.



GEORGE BRUMBACH, named chief metallurgist, The Carpenter Steel Co., Reading, Pa.



MEMO FROM THE PRESIDENT

Phil S. Coffer, President of C & H Supply Co., manufacturers of Metal-Cals

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J. M. Osborne, named Southern regional supervisor, unit ventilator and heating and ventilating products, American Air Filter Co., Inc., St. Petersburg, Fla.

Francis I. Kilcline, named district manager, Luria Brothers & Co., Inc., Kokomo, Ind.

Robert D. Tuttle, named marketing manager, The H. M. Harper Co.

Douglas Munroe, named asst. to executive vice president, The Anaconda Co., New York.

Richard C. Slater, named asst. gas truck sales manager, The Yale & Towne Mfg. Co., Philadelphia.

Arthur G. Walsh, named director, Research Div., Process Engineering Dept., National Research Corp., Cambridge, Mass.

Richard E. James, Jr., named manager, Indianapolis branch, Thor Power Tool Co., Aurora, Ill.

William J. Hennessy, appointed Eastern regional sales manager, Kelite Corp., Berkeley Heights, N. J.

Donald C. Kilpatrick, appointed parts sales promotion manager, Koehring Co., Milwaukee.

Ray W. Hermanson, named sales manager, The Wright Tool & Forge Co., Barberton, O.

C. R. Northey, appointed manager, Bower Roller Division's Hart Ave. plant, Federal-Mogul-Bower Bearings, Inc., Detroit.

John P. Bank, appointed sales engineer, Thor Power Tool Co., Aurora, Ill.

Rene Sonnenfeldt, appointed sales engineer, Bart-Messing Corp., Belleville, N. J.

Fred D. Ullmann, named field sales engineer, Loewy-Hydropress Div., Baldwin-Lima-Hamilton Corp., New York.



SIDNEY A. MATTHEWS, named machine tool analyst, Standard Pressed Steel Co., Jenkintown, Pa.



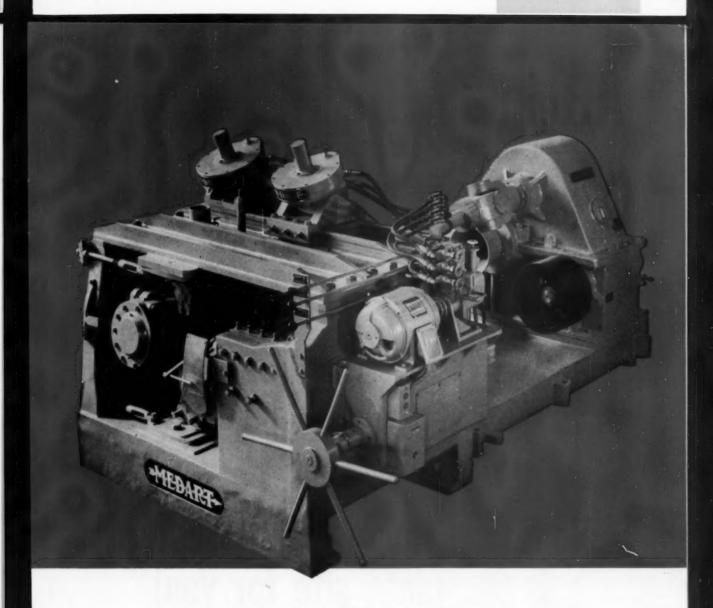
GEORGE C. WILSHER, elected vice president, engineering, Holcroft & Co., Detroit.



RUSSELL E. HOEHL, named asst. eastern sales manager, Russell, Burdsall & Ward Bolt and Nut Co., Port Chester, N. Y.



CHARLES E. BRACKBILL, appointed executive staff assistant, production, Laclede-Christy Co. Div., H. K. Porter Co., Inc., St. Louis, Mo.



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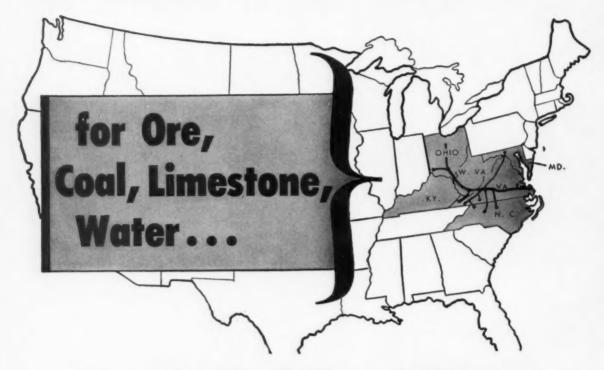
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Foundry and Mill Machinery Division

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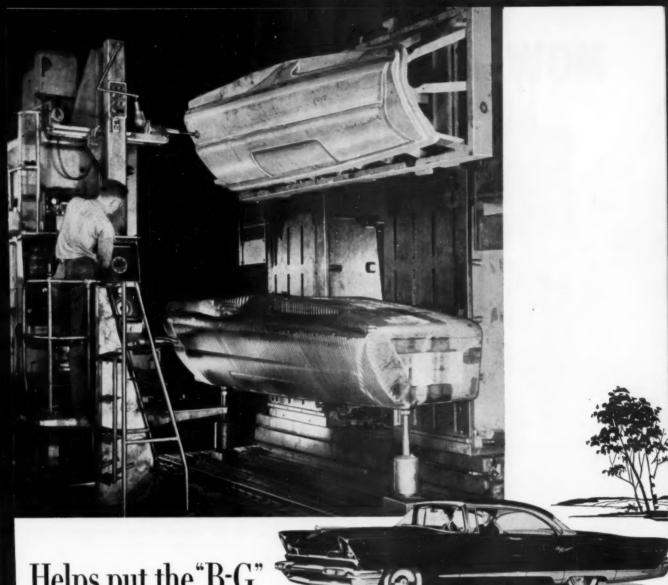
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Helps put the "B-G"



the PRATT & WHITNEY KELLER Type BG-22

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There's the right size Keller Machine for every plant, for every job. Capacities range from 36" x 20" (for the compact Type BL) to 20' x 7' (for the giant Type BG-22). Write for complete information outlining your requirements.



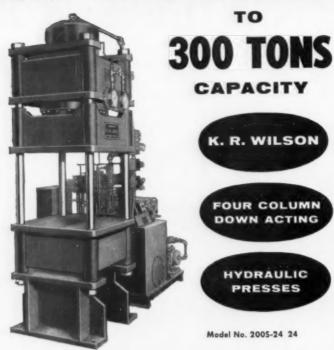


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GAGES

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William A. Weber, named asst. general traffic manager, Aluminum Co. of America, Pittsburgh.

J. J. Riggs, appointed sales manager, major appliances, Westinghouse Electric Supply Co., Pittsburgh.

Morris G. Munson, appointed Southern regional manager, American Air Filter Co., Louisville, Ky.

Charles B. Martin, appointed abrasive engineer, West Virginia, Norton Co., Worcester, Mass.

H. T. Doughty, named chief engineer, Transportation Products Dept., Stran-Steel Corp., Detroit.

Frederic E. Johnston, named chief accountant, Cleveland Works, Jones & Laughlin Steel Corp. C. R. Miller, named director, works accounting.

William J. Swan, named field engineer, Graphitic tool steels, Detroit office, Steel and Tube Div., The Timken Roller Bearing Co., Canton, O.

Joseph L. Bertoli, named mechanical engineer, New York, Allis-Chalmers Industries Group; John R. Teuschl, named mechanical engineer, Michigan.

John M. Suardi, named sales engineer, Graver Tank & Mfg. Co., Inc., San Francisco.

OBITUARIES

Stephen L. Ingersoll, president and general manager, Ingersoll Steel Div., Borg-Warner Corp., Chicago.

Ancil H. Bishop, 65, vice president, U. S. Industries, Inc.

Erle Gladstone Hill, former director, Metallurgy and Development, Wheeling Steel Corp.

PRECISION CONTROL

for Resistance Welding as accurate as the time signals of the U.S. Naval Observatory

Now, Satisfy Your Most Rigid Production Standards on Long or Short Runs

The Sciaky Predetermined Electronic Counter Weld Control employs a Dekatron tube to count the cycles of power line frequency and impulses of secondary current in predetermined absolute numbers and without deviation. Since power line frequency is maintained by reference to Naval Observatory time signals, you get these same standards of accuracy with the new Sciaky Control. Welder functions are CENTRALIZED—only one Dekatron tube is used to control succeeding functions such as "squeeze, weld, hold, and off".

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Sciaky Roll Spot and Seam Welder equipped with the Sciaky Predetermined Electronic Counter Weld Control.

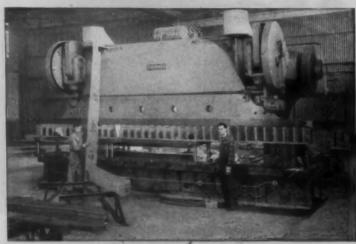
70 minutes cut

on combined blanking and punching operations!

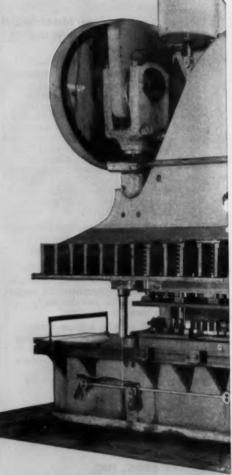
- FORT WAYNE STRUCTURAL STEEL CO., Inc. Fort Wayne, Ind.

This versatile Cincinnati All-Steel Press Brake, 34 Series x 16', has revolutionized the production of these long motor truck side rail reinforcements.

Check with our die engineering department on the application of a versatile Cincinnati All-Steel Press Brake in your shop. It can sharply reduce your production costs.



(A) Blanking floor to floor time 11/4 minutes. Previous time 34 minutes.



(B) Note Fort Wayne's ingenious punching equipment which reduced punching time from 36 minutes to 1½ minutes and took advantage of every versatile Cincinnati feature.

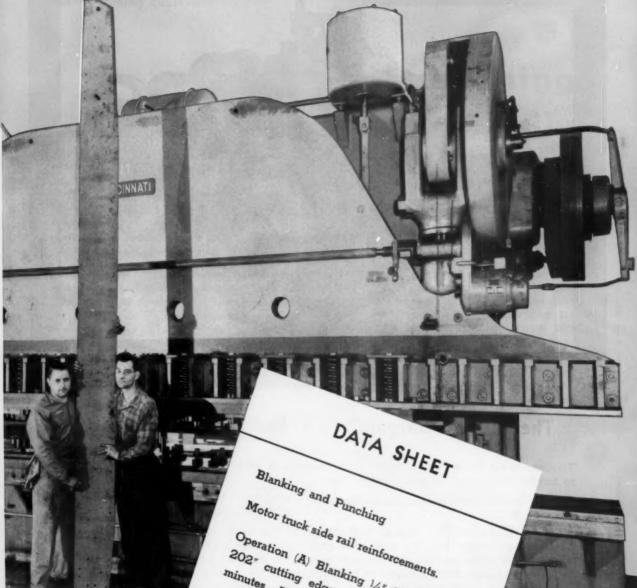


THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A.

SHAPERS . SHEARS . BRAKES

to 2.6 minutes...



Operation (A) Blanking 1/4" C 1010 Steel

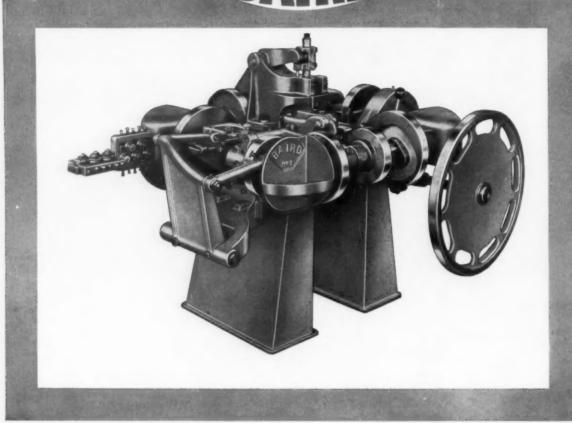
Operation (B) Previous time 34 minutes.

Stroke, Floor to floor—11/4 minutes, ous time 36 minutes, Previous minutes, Previous time 36 minutes, Previous time 3

John Z. Hayner

Photos Courtesy—
FORT WAYNE
STRUCTURAL STEEL CO., Inc.
Fort Wayne, Indiana

...ask BARD about it



The "hidden bargain" in a BAIRD Four-Slide

Thousands of Baird Four-Slide users... making everything from auto seat springs to bobby pins... say it isn't hard to find.

The "hidden bargain" is the cost-reduction know-how that goes along with every machine sold.

Baird pioneered the four-slide machine as the basic round and ribbon wire forming equipment used by every industry making such products. Baird has the most extensive experience files on tooling for this most versatile of high production equipment. Usually the problem that seems tough to the customer can be matched to a previous successful Baird application . . . thereby saving time and money in tooling.

With such a reservoir of past practical experience to draw upon, it's always good business to "ask Baird about it" when a four-slide application is being considered. Our range of standard automatic wire forming machines is complete, from the "bench top" No. 00 (400 lbs.) to the "room size" No. 8 (12,000 lbs.) . . . also two standard sizes of ribbon metal forming machines. Bulletin on request. Write Dept. IA.

THE BAIRD MACHINE COMPANY
STRATFORD CONNECTICUT

1BA56

Radial Draw Forming Bends Tough Alloys Easily

- How do you fabricate lightweight, high strength parts out of expensive alloys at minimum cost?... One good way is to make them in one piece to save joining costs, and make them so accurately that you avoid machining or hand fitting.
- Radial draw forming techniques solve many of these one-piece fabrication problems . . . Universal machines apply forming forces in three directions to do practically any type of contouring on sheet, extrusions, rolled sections.

By E. J. EGAN, JR., Machinery Editor

♦ IMPORTANCE of radial draw forming as a production contouring technique keeps increasing. The reason? Heavy emphasis today, in everything from home appliances to guided missiles, is on low cost, lightweight, high strength components.

At first glance, low cost might not seem compatible with high strength and light weight. After all, shooting for top strength-weight ratios often brings the most expensive grades of aluminum, stainless steel or titanium into the picture.

Answer then, to keep the final cost down,

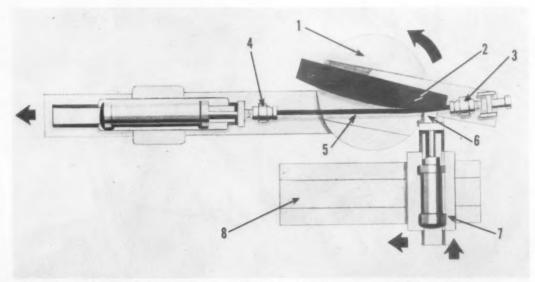


FIG. I—Principles of radial draw forming technique and basic components of the machine.

- I. Turntable
- 2. Forming Die
- 3. Table Gripper
- 4. Main-Ram Gripper
- 5. Workpiece
- 6. Compression Wipe Shoe
- 7. Hydraulic Compression Ram
- 8. Traverse Ways

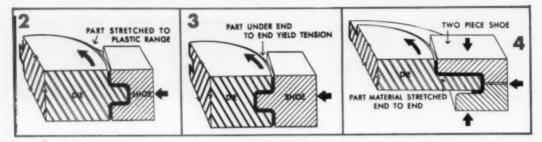


Fig. 2. Sizing cross sections

Fig. 3. Contouring open sections Fig. 4. Controlling horizontal flanges

is to make one-piece components that do not require joining operations. It also helps the economy drive if production machining and hand fitting at final assembly can be eliminated.

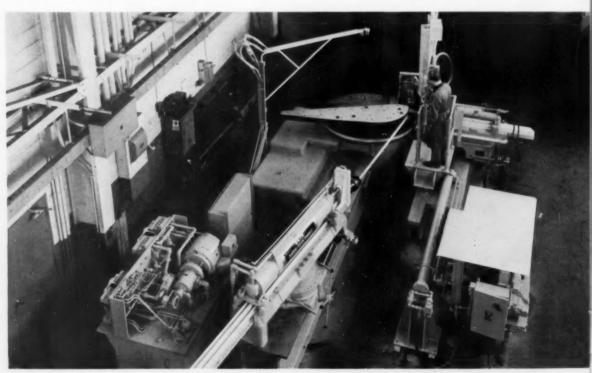
So, more and more fabricators face the task of making single-piece parts from hard-to-work materials. In many cases, precise and often complex contours must be combined with accurate cross-sections.

Very often, the contouring job requires bending sheet or plate material, extruded stock or roll formed lengths made from metal strip. It might call for anything from a slight bend to a full circle or more. Sometimes the need is for a complicated multiple or reverse bend, and it's not unusual to find a few jogs or sharp-angled offsets specified. Quite often, too, rising and falling vertical contours must be com-

bined with some bends in the horizontal plane.

Answer to many of these problems has been found in the radial draw forming techniques and universal equipment developed by the Cyril Bath Co., Solon, Ohio. Big machines can form 40-ft lengths of various metals into smooth contours, including 148-in. diam circles. Skins up to 9-ft wide and 25-ft long, tapered or varying in contour, can also be formed on machines with sufficient stretch-tonnage capacity.

Fig. 1 illustrates principles of the technique and basic elements of the forming machine. As shown, a metal sheet, extrusion or rolled form is held firmly between the table gripper and main ram gripper. Tension, applied uniformly by the hydraulic stretch ram, loads the work to a point above its yield strength but short of ultimate tensile strength. With the work thus held in yield-tension, the rotary



INITIAL stage of drawing a Z-shaped aluminum extrusion to contour an aircraft component.

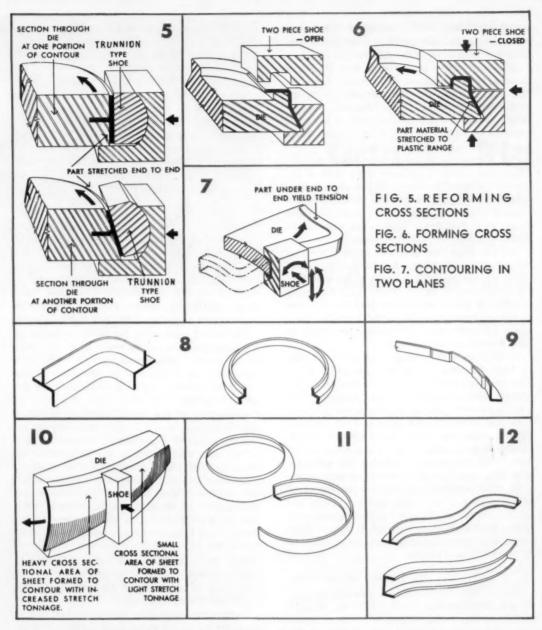


Fig. 8. Forming severe bends Fig. 9. Joggling and offsetting Fig. 10. Contouring tapered sections Fig. 11. Contouring beyond 180° Fig. 12. Forming reverse contours

table turns the forming die into the work. Simultaneously the compression ram moves a shaped "wipe shoe" into contact with the outer surface of the workpiece.

In making a true-radius or full circle bend, the wipe shoe remains stationary at the fixed point where the work being formed is tangent to the contouring die. But for other than true-arc bends, the compression ram and wipe shoe assembly moves laterally on traverse ways. Thus the shoe compresses and wipes the work at successive tangent points where stretch ten-

sion and die rotation gradually form the desired contour. Triple action of stretch ram, rotating die and wipe shoe forms parts with one-tenth to one-third the force used in straight stretch forming.

Shape of the wipe shoe and the force it brings to bear combine to set a precise, permanent contour in the workpiece. The same form and force can also act to either control or alter the cross sectional form of the finished part.

For example, the wipe shoe in Fig. 2 is shaped to maintain form and angularity of the

workpiece profile. This minimizes thin-out at sharp bends, and also permits close fits in final assembly with little or no benchwork.

Similarly, action of the wipe shoe in Fig. 3 insures proper support and control for open "U," hat, channel and like sections during the contouring operation. True size and angular relationships are maintained without need for separate mandrels or sine bars. Mating parts usually fit the finished workpiece easily.

Fig. 4 shows a two-piece wipe shoe. Arrows above and below it indicate that, with a hydraulic cylinder mounted on the shoe holder, compression-wiping forces can be applied in a vertical as well as a horizontal direction. This keeps wide horizontal flanges flat and at the proper angle to the vertical flanges.

But the wipe shoe has uses beyond those of mere control efficiency. A trunnion-type shoe (Fig. 5) can actually reform a cross-section while a part is being contoured. A simple knuckle or hinge mechanism permits the shoe to follow changing angles on the form die. Thus parts formerly made in sections can often be fully formed in one operation.

In addition to reforming, wipe shoes can also do basic forming during the contouring cycle. This requires a vertical thrust-type shoe holder and a horizontally-split shoe with suitable lead-in grooves, Fig. 6. In the closed position, a shoe of this type will actually form lips and flanges while the workpiece is simultaneously stretched and compressed to the desired contour. This technique eliminates the need for sine bars, mandrels and reflanging operations.

In other applications, vertical movement of the wipe shoe (Fig. 7) can produce rising and falling curves at the same time contours are being formed in the horizontal plane. Here again, the major advantage is the possibility of one-piece construction.

Permits severe bends

Radial draw forming also permits making severe, small-radius bends (Fig. 8) without rupturing the work. Traversing the compression-wipe shoe across the outer surface of the bend supplies a planishing action that keeps the metal from being overstretched and weakened.

For example, some alloys are not ductile enough to be severely bent by a straight stretch-bending process. But in radial draw forming, the work is stretch-bent only a part at a time, and each part is simultaneously compressed and planished by the traversing wipe shoe.

This combination of forces keeps elongation of the metal in the outer bend surface well within rupture limits. Same planishing action also minimizes thin-out at severe bends.

In other design problems, available pressure tonnage in the wipe shoe ram is often sufficient to form joggles and offsets in contoured parts, Fig. 9. Where this feature can be applied, there is no need for separate joggling attachments, part-holding fixtures or hand work.

Radial draw forming can frequently be applied successfully to the contouring of parts that taper from end to end, or otherwise vary in cross-sectional area throughout their length. As shown in Fig. 10, use of the compression wipe shoe midway in the bend allows increased stretch pressures to be put on heavier cross-sectional areas. Thus contours can be "set" in these areas without overstretching thin spots.

Forms hook shapes

Rotary table design in radial draw forming equipment also permits infinite rotation of the form die in either direction. As Fig. 11 shows, part curvatures beyond 180° can include spirals and full 360° wraparounds in circular, oval or rectangular shapes. The same rotational flexibility allows forming of severe hook shapes at one or both ends of workpieces.

For added production flexibility, rotation of the form die table can be reversed at any point in its travel. This means that "S," "W" and other reverse curves can be contoured in one length of material, using a single forming die setup, Fig. 12.

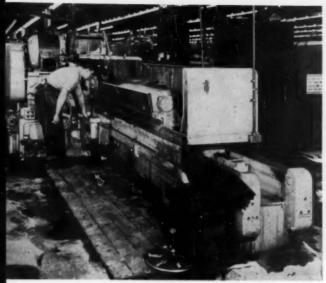
Versatility of the radial forming technique and equipment does not limit accuracy in repetitive production operations. Proof is offered by records maintained in the fabrication of stainless steel rings, made in a wide range of diameters, and in a variety of irregular-channel, angle-hat and flattened-C cross-sections. Tolerances in finished parts ranged from ± 0.002 in to ± 0.01 in. in diameter and cross-section, and from ± 4 to ± 30 minutes on specified angles.

Bath Co.'s machines are rated according to stretch tonnage capacity, range from 8 to 350 tons. Bulk of equipment in use consists of 12½, 25, 35 and 50-ton machines.

Automotive industries comprise one major customer group, use radial draw formers to manufacture such random items as bumpers, rub rails, moldings, zee bars, "fifth wheels" for truck-trailer units.

Railroad cars and buses gain more loadcarrying capacity by virtue of the numerous one-piece, draw-formed structural parts they contain. And since the Korean War, essentially every major manufacturer of airplanes, helicopters, jet engines and guided missiles has in stalled Bath radial draw forming machines for fabricating critical components.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from READER SERVICE DEPT., The Iron Age, Chestnut & 56th Sts., Philadelphia 39, Pa.



MAGNETIC swivel bar holds several shear knives at correct bevel angle for grinding.

Grinder Rig Re-Edges Shears Accurately

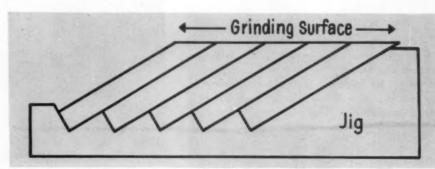
• HOW DO YOU treat your shearing knives? The duller they get, the higher the shearing pressures run. Worn or poorly sharpened blades are bound to eat into your shearing equipment's reserve capacity. Even worse, perhaps, is that they cause maintenance costs to jump upward excessively—and unnecessarily.

An adequate preventive maintenance program helps control costs here. And there's little reason these days for farming the job out. Frequently, present shop equipment can handle the resharpening operation with ease.

The work involves removing just enough steel at just the right bevel to restore a sharp edge. Many modern grinders can meet this need for highly uniform, accurate bevel grinding. At Simonds Saw and Steel Co., Fitchburg, Mass., a Mattison face grinder can generate a variety of bevels to suit the particular needs of individual shear blades. A magnetic swiveling knife bar fitted to the traveling table makes possible the machine's flexibility.

A similar installation enables sharpening of several shear blades in a single setup. It calls for use of a large, reciprocating-table surface grinder fitted either with a horizontal or vertical spindle. A simple jig (shown nearby) supports the knives at the proper angle for generation of the bevel.

Variations of the idea are easy to conceive. It's also readily adaptable to a variety of circumstances.



SIMPLE jig permits generating uniform bevel on shear knives with surface grinder.



SOUVENIRS for all will serve as continuing reminders of "Family Day" and its plant tours.

Makes willing workers-

Humanics: Liberal Doses Cure Production Ills...

- More men, money and machines . . . That's a standard (and expensive) formula for boosting production . . . It's much less costly if you can encourage your regular work force to get more out of existing equipment . . . That's the art of humanics.
- Bell Aircraft Corp. virtually doubled helicopter production in a recent two-month period when management ladled out humanics in generous portions ... Workers and their families loved it ... Here's a blueprint of how it was done.



RESULTS of extra effort by workers show up in more helicopters ready for final assembly.

 PRODUCTION EXECUTIVES traditionally apply increasing amounts of men, money and machines to solve knotty production problems.

But Bell Aircraft Corp.'s Texas Div. nearly doubled its Spring helicopter production without increasing any of these items substantially. Humanics—the study of human nature—made the difference.

Mid-winter sales of the company's commercial helicopters had far exceeded the planned production schedule. This posed a problem of how to produce almost twice the scheduled number of machines without disturbing military production programs, and without increasing manpower or facilities.

Top management asked the internal communications group of the company's public relations department if they could encourage the normal work force to do an extraordinary job in March and April.

With only four days of February left, the internal communications staff called together the heads of other public relations groups: employee publications, photographic, graphic arts, and the press bureau. Group heads held a "brainstorming" session, came up with a clever and effective promotional plan.

Decision was to divide the two-month problem period into two separate campaigns—but to announce only one at a time.

Arouse curiosity first

Overnight a "Forward in March" campaign for 20 ships got started with a teaser. For two days prior to March 1, a large footprint-and-question-mark poster was prominently displayed at key points throughout the plant. Then, on the last day of February, employees coming to work saw giant whitewash footprints leading from the entrance gates to all factory and office doorways.

From March 1 to the end of the month employees were encouraged with such slogans as: "Build, Test and Sell 20 Commercial Helicopters in March," "Set a World Record," "Meet the Challenge," "Do a Job," and "Let's Pull Together." They got these messages through the widely read employee publication, division bulletin boards, memos from executives, rubber stamped messages on all inter-office correspondence.

In addition, slogans were printed on: slingers, written and distributed by all union groups; pay envelopes; cardboard spinning toys inside pay envelopes; pasted-up labels; tags for parts and assemblies; and button-hole tags for employees to wear. Daily production progress was recorded on key-location displays by painting-in one blank footstep for each helicopter delivered.

This "Forward in March" plan was highly successful. Whereas the original March schedule called for only eleven commercial helicopters, on March 31 the twentieth ship of the month was delivered to a customer.

A grand announcement of success was made to

all employees at the delivery ceremony. Huge football goal posts were erected to display all the 'posters that had individualized each ship built in March.

Then on April 2nd, employees received an even greater challenge: a "Hit the Bullseye" campaign to build 23 ships before month's end. Workers learned that if they succeeded in building, testing, and selling 23 ships in April they would be rewarded with a "Family Day" celebration at the plant.

Campaign pays off

Throughout April personnel were bombarded daily with different types of the techniques used in the March campaign. Production progress was scored by placing full-sized arrows in regulation archery targets near the plant's main entrances.

On the day before the month ended the 23rd ship was delivered on schedule.

Less than six weeks later more than 12,000 employees and their families attended the big reward party. Each employee guided his own family. Highlights of these individually conducted tours were craftsmanship displays which had been proudly created by department workers.

Gifts for the ladies, toy helicopters and balloons for children, lemonade and orangeade for all were handed out at the end of these tours. And all visitors were served a Texas-style barbecued beef and chicken dinner.

A three-hour helicopter air demonstration and a two-hour stage show completed the day's activities.

Bell executives are convinced that in modern industrial management the key to success lies not in the amount of men, money, material, and machines a company is able to amass, but in a group of willing, able, and loyal employees. They believe that their greatest asset is the human will to work—a much misunderstood and often unappreciated commodity.



DAD shows the family how an air gage is used to see that critical parts are accurately made.

Zinc-Rich Paint: A Coating For Problem Surfaces



Photo by New Jersey Zinc Co.

CHAIN LINK fence protected with zinc-rich paint withstands linkage corrosion.

- ◆ An anti-corrosive paint, high in zinc content, adheres firmly even to mill-scaled steel . . . Yet, it can be applied like conventional paints by brush, dip or spray methods . . . It also adheres well to tough-to-paint galvanized surfaces.
- ◆ Zinc-rich paint offers protection similar to that of galvanized surfaces... Metal content of the dry film runs as high as 95 pct... It requires no special cleaning—just wire brush away loose rust and scale.

By D. E. WILBUR, Executive Vice President, The Wilbur & Williams Co., Brighton, Mass.



Photo by New Jersey Zinc Co.

MICROWAVE RELAY tower typifies structural steel design well suited for zinc-rich paint.

♦ ZINC-RICH PAINTS are among the few coatings capable of active corrosion protection when applied directly over rust or mill scale. They also belong to that select group of paints which permit arc- or resistance-welding of the base metal after painting, with little danger of harmful inclusions.

Even more, zinc-rich paints display many favorable properties of hot-dipped or electroplated zinc coatings. At the same time, the finish can be brushed, dipped, even sprayed with the ease of other paints, in the shop or in the field.

Last serious deficiency—settling in the can now seems overcome. Tendency of the heavy pigment to settle from the liquid paint vehicle on standing might be expected of any coating made up predominently of metal. Trouble with settling previously discouraged its use by some finishers.

Relative stability of the zinc-rich suspension, now feasible, may turn attention to the paint's more favorable aspects. Versatility forms perhaps its most attractive feature to metalworkers.

Exactly what is zinc-rich paint? Simply a coating, but bearing so much metallic zinc that for all practical purposes it resembles dipped or plated zinc films in many of its properties. The dry film contains upwards of 95 pct finely divided zinc in a nonmetallic residual paint vehicle.

The vehicle functions to give the coating most characteristics commonly associated with paints. When dry, the vehicle provides mechanical strength, and toughness. Varying the formulation makes possible somewhat harder or softer films.

Zinc in the dry film responds not unlike a solid film of metal, at least so far as corrosion protection is concerned.

Mechanism by which zinc protects other metals, notably iron and steel, involves sacrificial corrosion. Essentially, in a metallic system comprised of a ferrous base material coated with zinc, the zinc corrodes in preference to the iron.

Galvanic reaction, key here to corrosion protection, is fairly well understood. Two dissimilar metals in intimate contact can behave in presence of moisture somewhat like a shortcircuited dry cell battery. The electrochemist will refer to creation of a galvanic cell by the bimetallic couple.

A measureable electric current can flow between the two metals. This current literally transfers metallic ions from the anode to the cathode. Corrosion results, termed galvanic because of its electrochemical nature.

The table lists the more common metals and alloys in order of their galvanic activity. Any metal in this list will sacrifice itself to protect any other metal below it in the column.

Three common metals can protect iron and steel through sacrificial corrosion. Of these, zinc normally is more economical and practical to use.

Protective action of hot-dipped galvanized sheet can be easily noted. Scratch such a sheet down to the steel subsurface. Expose the sheet to moisture. You'll find no corrosion appears in the scratch as long as zinc is present.

With development of zinc dust—zinc oxide paints came a way of applying this same zinc protection to diverse sizes and shapes of ferrous materials. Previously, whole classes of steel products (structural steel, for example) lent themselves poorly to zinc protection by conventional means. There's a limit to physical dimensions of hot-dip and electroplating tanks. Complex shapes usually prove difficult to coat uniformly by standard methods.

New blend lasts longer

Earlier form of zinc-bearing paint, effective within its capacities, has certain limitations. Surface to be painted must be carefully cleaned and prepared. Paint must be mixed on the job from two separate containers immediately before applying. Reaction then starts fairly quickly, limiting time in which paint can be applied. Pot life is relatively short.

Despite these handicaps, zinc dust—zinc oxide paints enjoy considerable use. This in response to their convenience and favorable film properties. Interior of cold water tanks exemplifies one current application.

Zinc dust—zinc oxide paints contain about 80 pct zinc pigmentation, plus about 20 pct vehicle in the dry film. This leads to another possible difficulty. There's always the question of the vehicle partially insulating the zinc dust from

contact with the ferrous surface. If this occurs, interference with desired galvanic action can be anticipated.

Zinc-rich paints help solve many if not all these problems. The coating approaches actual galvanizing more closely than any paint film yet developed. Zinc-rich film, when dry, provides pigmentation comprising about 95 pct finely divided zinc in only 5 pct nonmetallic residual vehicle.

Until recently most zinc-rich paint formulations proved somewhat troublesome to users. Zinc tended to settle in the paint container. There's been difficulty too in getting the heavy pigment back into proper suspension after settling occurs. You normally might expect this from a paint containing more than 95 pct metal.

Spray zinc flakes

Now at least one paint maker reportedly has overcome this deficiency. It's now supplying a commercial product claimed relatively nonsettling, therefore suitable for brushing and spraying.

Paint chemists at University of Cambridge developed the basic zinc-rich coating some years back. Some earlier formulations have undergone testing up to 15 years. Laboratory and field tests there and elsewhere provide ample

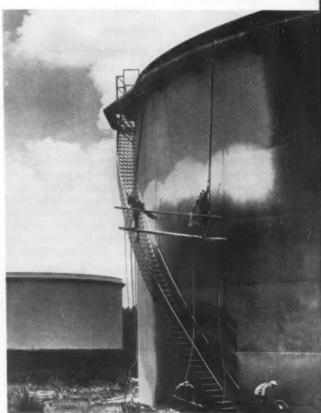


Photo by New Jersey Zinc Co.

SPARY-PAINTING 80,000 barrel Louisiana oil tank with 95 pct zinc protects it for years.

"Zinc-rich paints adhere even to corroded surfaces . . . also find use as welding primers."

(anodic end)

	Magnesium	
Ŧ,	Aluminum	
increasing corrodibility	Zinc	
o L	Cadmium	
S D	Iron or Steel	
SILIC	Tin	
92	Lead	Q.
	Nickel	cre
	Brass	asin
	Bronze	decreasing corrodibility
	Соррег	orro
	Silver	d b
	Gold	lity
	Platinum	

(cathodic end)

evidence of the coating's inherently desirable properties.

Zinc-rich paints offer rather unusual freedom of application. They adhere firmly even to corroded surfaces, after elimination of loose rust and scale. Zinc flakes apparently cling to all particles of the ferrous surface, whether rusted or not. This leads to effective protection without need of reducing the surface to a completely clean state.

Protect over mill scale

Last point also highlights the distinct possibility that zinc-rich coatings will prove satisfactory on steel even in presence of incipient mill scale. Such scale can prove troublesome, particularly on fabricated steel weathered for some time before painting. In theory, to achieve best adhesion, scale should be completely removed before painting. In practice, this is seldom done, or even considered feasible.

So Cambridge University reported its results with some satisfaction. Tests show wire brushing or a wipedown assures a strong bond between the metal surface and the paint film. Just eliminating loose or scaling rust suffices for good

adhesion. Such a coating strongly protects ferrous metals, even retards mill scale destruction of the surface. This in itself can give promise of a good future for zinc-rich coatings.

Zinc-rich paints also find uses as welding primers. This results from their conductive properties. Steel sheet can be arc- or resistance-welded after painting. The coating not only protects the weld, but after fabrication it resists corrosion in sections and recesses then difficult to reach for farther painting.

Another use for zinc-rich coatings involves protection of ship bottoms. Anti-fouling compounds based on copper or mercury can cause severe corrosion when applied directly to the steel bottom of a ship. Actual destruction of the steel hull can result. This takes place as the steel corrodes sacrificially in favor of the copper or mercury.

Zinc-rich paint applied directly to the steel helps avoid this. After insulation by an inert paint overcoat, final coat of anti-fouling compound can be applied without danger.

Pass salt water test

Tests at Cambridge on protective qualities of zinc-rich paint seem to support basic claims. A comprehensive salt water field test shows this. Twin test panels were employed, one of zinc-rich primer plus a marine-type topcoat, the other of a standard corrosion-inhibiting primer with the same topcoat.

Both panels were scratched through the paint film to the steel undersurface. Both underwent a 4-month immersion in salt water. After some 2800 hours, the zinc-rich paint continued serviceable. The other panel showed corrosion after the same exposure. Undercutting action helped cause bubbling beneath the latter paint film.

A second series of tests also at Cambridge tends to verify ability of zinc-rich paints to protect galvanically over rusty metal.

Testers wire-brushed loose rust from thoroughly corroded steel, previously weathered for over one year. They then applied zinc-rich paint. Precise electrical measurements of emf determined amount of galvanic action taking place.

Report concludes that the paint actually makes metallic contact with underlying metal, even through the rust layer. So it apparently serves its desired galvanic protective purpose.

One of the brighter points in the zinc-rich picture lies in ability to apply the paint in any thickness desired for resistance to weather or other corrosive conditions. Used as a prime coat, 1 lb normally covers about 48 sq ft 3 mils thick. Same amount when spread over 24 sq ft averages 6 mils thick.

In justifiable applications, the paint generally has little trouble paying for itself. Cost of material normally runs about 2 cents per sq ft. in 3 mil thicknesses. It can be applied to bare sheet at little more cost than the price differential between galvanized and hot-rolled sheet.

How Carbon Content Affects Impact Properties

- Few metallurgical topics are more important than the subject of brittle fracture . . . Heat treated, low alloy steels—despite other engineering advantages—are not immune to this type of failure.
- ♦ Carbon and alloy content are crucial factors in determining impact properties . . . This comprehensive report relates these factors to eight low alloy steels . . . Down-to-earth, it deals with those grades most important to the metalworking industry—the grades in everyday use.

PART I

By H. SCHWARTZBART, Supervisor, Welding Research, and J. P. SHEEHAN, Supervisor, Applied Metallurgy Research, Armour Research Foundation of Illinois Institute of Technology, Chicago

◆ HEAT-TREATED alloy steels provide many distinct engineering advantages as constructional materials. Much of our industrial capacity, as well as our future potential, is dependent upon their use. But—in common with constructional mild steel—these steels are capable of at least one critical shortcoming. They can fracture in a brittle fashion.

To better understand embrittlement, a comprehensive research program on the impact properties of quenched and tempered steels was recently completed by Armour Research Foundation of Illinois Institute of Technology, Chicago. Eight of the common AISI-SAE structural alloy steels from both commercial and laboratory heats were used to investigate a wide range of variables. The program was sponsored by the Office of Naval Research.

In line with the general problem, the scope

of the program was necessarily broad. It included studies of the effect of carbon content, alloy grade, molybdenum to phosphorus ratio, boron, rare earth additions, grain size, homogeneity and specimen size.

Some view of the overall aspects of the problem is helpful in understanding and interpreting the test results. The effects of tempering are typically fundamental.

Test widely used grades

When a piece of steel is quenched in such a way that martensite is formed throughout the section, tempering after the quench softens the steel. At any given tempering temperature, there is a rapid initial drop in hardness followed by more gradual softening in the later stages of the tempering process.

For practical purposes, the tempering for one hour of a small piece of steel such as a Charpy specimen gives an approximation of the result to be obtained by many commercial tempering treatments that are applied to martensite. In this investigation the impact specimens were austenitized and quenched to form martensite, and then tempered for one hour.

Eight widely used grades of alloy steel were investigated: 1300, 2300, 3100, 4100, 4300, 4600. 5100 and 8600. At least three carbon levels.

[■] First of a three-part series, this article is based on one of the most comprehensive programs on the impact properties of low alloy steels ever conducted. Sponsored by the Office of Naval Research, the program required years of intensified research for its completion. Subsequent installments dealing with the effects of boron and rare earth additions, grain size, and other basic variables, will appear in the issues of August 16 and 23. Watch for them. They're important.

Chemical Analysis of Steels Investigated

Gr M		911						Numinal	
	Gr	Ni	Si	S	P	Mn	С	Grade	Heat
	-	***	0.23	0.027	0.023	1.60	0.24	1320	3740
Tra	None	0.04	.21	.031	.018	1.70	.40	1340	1
	-	-	.17	.022	.023	1.66	.73	1380	3779
	-	3.47	.17	.027	.025	.91	.18	2320	2714
	-	3.50	.16	.027	.025	.88	.33	2330	2722
		3.38	.22	.028	.020	.83	.43	2340	0
		3.50	.16	.026	.025	.91	.57	2360	2725
	_	3.50	.19	.025	.025	1.00	.75	2380	2727
	.58	1.26	.30	.020	.022	.75	.23	3120	3745
	.64	1.26	.19	.031	.013	.77	.38	3140	J
	. 63	1.34	.25	.028	.022	.92	.72	3180	3781
	. 95		. 30	.020	.019	.89	.24	4120	3808-3
	. 95	-	.30	.020	.031	.89	.24	4120P*	3808-6
	.89		.26	.026	.016	.89	.40	4140	K
	.96	Acres .	.22	.025	.037	.87	.41	4140P	3729
	1.02	enter.	.20	.029	.023	.95	.74	4180	3814-3
	1.02	-	.20	.029	.034	.95	.74	4180P	3814-6
	1.00	1.53	.23	. 016	.020	.74	.21	4320	2921
	1.10	1.69	.31	.021	.024	.84	.30	4330	2716
	.93	1.65	.25	.035	.020	.77	.38	4340	M
	1.08	1.62	.23	.019	.025	.87	.57	4360	2718
	1.11	1.67	.23	.020	.024	.91	.76	4380	2720
	.30	1.85	.25	.011	.015	.67	.20	4620	375.
	.29	1.78	.30	.018	.009	.69	.43	4640	L
	.30	1.81	.19	.011	.012	.77	.74	4680	3792
	1.00	-	.28	.025	.023	. 85	.23	5120	3798-3
	1.00		.28	.025	.036	. 85	.23	5120P	3798-6
	.87	Arrest.	.19	.034	.014	.80	.38	5140	P
	.89		.16	.024	.037	.81	.40	5140P	3816
	.91	-	.21	.031	.037	.79	.35	5135P	3717
	1.00	-	.23	.029	.023	.95	.72	5180	3813-3
	1.00	new.	.23	.029	.035	.95	.72	5180P	3813-6
1	.68	.60	.14	.018	.022	.89	.20	8620	2730
	.62	.66	.12	.020	.020	.77	.34	8630	2820
1	.61	.65	.16	.011	.020	.78	.45	8640	N
	.56	.70	.34	.022	.018	.81	.56	8860	2928
	.60	.67	.11	.011	.020	.81	.76	8680	2817

* The letter "P" indicates a high phosphorous heat.

0.20 pct, 0.40 pct and 0.80 pct, were reviewed. For the 2300, 4300 and 8600 series, carbon levels of 0.30 pct and 0.60 pct were also tested.

The 4100 and 5100 series were tested at two levels of phosphorus content by utilizing split heats. These series have the same compositions except for molybdenum, which 4100 contains, but 5100 does not. Analyses of all the steels tested are shown in Table I.

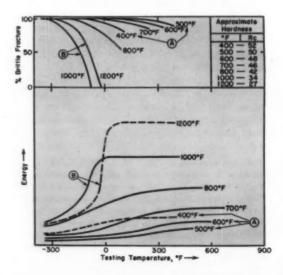
The heats were made in a 500 lb laboratory induction furnace by fine grain practice ($1\frac{1}{2}$ lb aluminum per ton of steel). Sixty-five poundingots were poured from each heat.

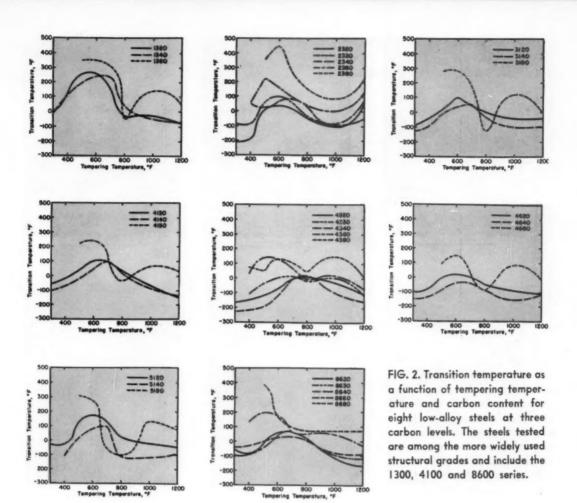
The ingots were forged to $\frac{1}{2}$ by $2\frac{1}{2}$ in. bars from which the impact specimens were cut. To prepare the steel for machining, the forged bars were normalized from the temperatures listed in Table II. They were then heated for one hour at $1200^{\circ}F$ and air cooled.

The specimens were austenitized for 30 minutes at the temperatures shown in Table II, oil quenched, tempered for one hour, then

FIG. 1 (Right) Effect of tempering temperature or hardness of 0.40 pct tempered martensite on fracture-testing temperature relation (above) and the energy-testing temperature relation (below).

water quenched. Austenitizing and normalizing prior to machining were performed at the same temperature. This temperature was varied with carbon content in order to obtain fine grain sizes as listed in Table II. The hardenability of all the grades investigated was sufficient to harden the specimens completely.





The transition energies, temperatures taken from the impact energy curves, and hardness data were all recorded. The criterion of transition temperature used in connection with the evaluation of carbon and alloy contents is the temperature at 80 pct of maximum energy. Depending upon the particular emphasis, these results are plotted against tempering temperatures, against hardness with carbon content as the parameter and with alloy grade as the parameter. Values for 80 pct of the maximum energy are also shown.

The variation of transition temperature with tempering temperature is related to the variout types of embrittlement exhibited by tempered martensite.

A-brittleness is that embrittlement exhibited by tempered martensites in the tempering range of 500-800°F. All of the steels tested exhibit A-brittleness. The amount of A-brittleness and the tempering temperature at which the A-brittleness peak occurs are functions of carbon and alloy contents. The amount of A-brittleness is greatest for the 0.80 C heats.

The temperature at which the peak occurs varies at the 0.40 C level from 600-800°F. The

4340 peaks at the highest temperature, 800°F, and has the lowest transition temperatures at the low tempering temperatures (high, strength levels). The straight manganese 1300 grade exhibits the greatest amounts of A-brittleness in general while the molybdenum-bearing grades show the least embrittlement.

B-brittleness affects 2300 series

B-brittleness is believed to be caused by the formation of austenite upon tempering at 1200°F, which then transforms to martensite upon quenching or at a later time upon testing. It is exhibited by the 2300 series only. Slight reversals are evident in 4640 and 5140, but the 2300 series is the only one which shows this tendency as a grade and to such a large extent.

Temper brittleness is developed in alloy steels by tempering in the range from 950 to 1150°F for extended times or by cooling slowly through this range. The specimens used in this study were tempered for one hour and quenched. Ordinarily, this treatment would develop very little, if any, temper brittleness.

With the exception of the 2300 and 8600

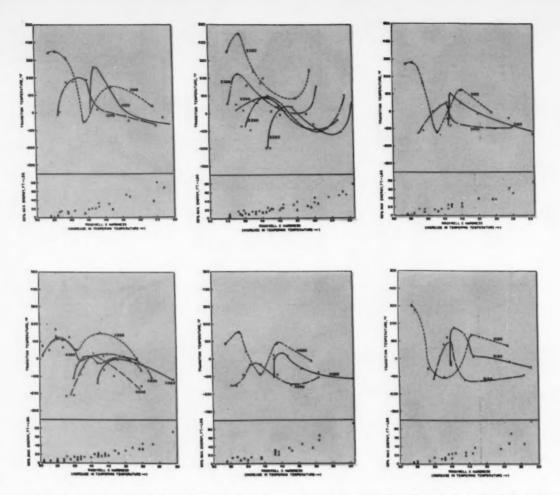


FIG. 3. Transition temperature and 80 pct of maximum energy as a function of hardness and carbon

content for eight low-alloy steels. Individual steel series are noted on each chart.

series, the 0.80 C heat of all grades exhibited a peak in transition temperature at a tempering temperature of 1000°F. This peak was generally not as high as the peak caused by A-brittleness at a tempering temperature of 500-700°F.

It is evident that a high carbon content aggravates temper brittleness. Grades of steel which developed no temper brittleness at low and intermediate carbon contents did develop brittleness in the 0.80 C heats.

An examination of the temper embrittlement maxima obtained by tempering the 0.80 C heats at 1000°F indicates the beneficial effects of molybdenum in minimizing temper brittleness. Grades 2380, 4380, and 8680 show no maxima at all. The first is a straight nickel grade and the other two contain molybdenum.

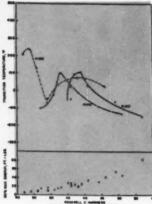
The remaining grades fall into the following order as regards amount of temper brittleness exhibited, with 4100 showing the smallest peak and 5100 the largest: 4100, 4600, 1300, 3100,

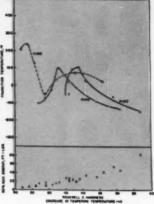
and 5100. The three worst grades contain no molybdenum. Both the nickel grade and the molybdenum-containing grades show less temper brittleness or none at all.

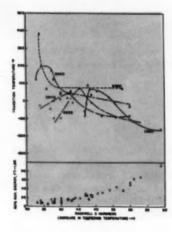
The curves of transition temperature vs hardness have the same general shape as those of transition temperature vs tempering temperature. They are displaced relative to one another because of the different abscissa.

Curves show similarities

With the exception of the temper brittleness exhibited at a hardness around Rc 40 in the 0.80 C heats, the curves of transition temperature vs hardness are somewhat homologous within any one grade. This includes the A-brittleness peak which moves toward higher hardness as the carbon content increases. The height of this peak is the greatest for the 0.80 C heat in each grade and is the lowest for the 0.40 C heat in the 1300, 3100, 4600, 5100, and 8600 series.







TABLEII Normalizing and Austenitizing Temperatures, As-Austenitized Grain Size

Heat	Nominal Grade	Norm. and Aust. Temp., °F	Aust. Grain Size ASTM No.
3740	1320	1650	9
1	1340	1050	8
3779	1380	1450	8
2714	2320	1650	6-7
2722	2330	1575	7-8
0	2340	1550	8-9
2725	2380	1475	7-8
2727	2380	1450	7-8
3745	3120	1650	
J	3140	1550	8-9
3781	3180	1450	9
3808-3	4120	1650	8-9
3808-6	4120P	1650	8-9
K	4140	1550	8-9
3729	4140P	1550	8-9
3814-3	4180	1450	8-9
3814-6	4180P	1450	8-9
2921	4320	1650	8-9
2716	4330	1575	8-9
M	4340	1550	8-1
2718	4360	1475	7-1
2720	4380	1450	8-9
3751	4620	1650	8-1
L	4640	1550	7-
3792	4880	1450	8
3798-3	5120	1650	7-1
3798-6	5120P	1650	8
P	5140	1.550	7-
3816	5140P	1550	8
3717	5135P	1550	7-
3813-3	5180	1450	8-
3813-6	5180P	1450	8
2730	8620	1650	8-
2820	8630	1575	7-
N	8640	1550	8-
2928	8860	1475	8-
2817	8680	1450	8-

The carbon content with the lowest transition temperature for any given hardness depends upon the particular hardness chosen. The best overall compromise seems to be carbon contents of 0.40 and 0.30 pct which generally have the lowest transition temperatures at hardness under about 40 and above about 49. Exceptions are the low carbon heats of the 2300, 4100, and 4300 grades.

The question of which alloy or combination of alloys best promote low transition temperatures is one of vital interest to all engineers who design structures for low temperature service. Unfortunately, on the basis of transition temperature, there is no consistent rating that can be assigned to the various grades of steel at all carbon contents or hardness levels. At certain hardness (Rc 34 in the 0.20 C steels) there is very little spread in transition temperature for all grades of steel. But at other hardness levels the spread may amount to several hundred degrees.

The important conclusion is that no one alloy

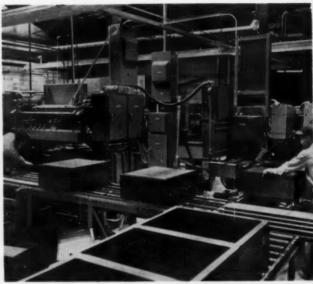
grade is superior at all carbon and hardness levels, even within the limits of these tests.

Commercial heats of the eight grades of steel were checked in the same manner as the laboratory heats. Some of the commercial heats were basic open hearth, others were basic electric furnace heats. All were of the same fine ASTM grain size, in the heat treated condition, and contained 0.40 pct carbon.

As a group, 80 pct of maximum energy transition temperatures are higher for the commercial heats than for the laboratory heats. Maximum energy values obtained above the transition range are also higher for the commercial steels. In many respects the data from the commercial heats bear out the test results gained from the laboratory heats.

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◆ FOUR spotwelders function as one to automatically weld-fabricate a steel kitchen cabinet every nine seconds. Production rate with the new electronically controlled setup can reach 400 hourly, with four operators. Earlier, 18 men working 10 handguns and 8 pedestal welders managed to turn our 140 cabinets per hour.

Designed by Toledo Desk & Fixture Co., Maumee, O., it's used there in fabricating "Beauty Queen" kitchen cabinets and "Lavanette" bathroom vanities from stamped sheet steel. Resistance Welding Corp., Bay City, Mich., built the machine. It can weld all or part of every cabinet the firm makes. Cabinet styles include wall, base, pedestal, undersink and broom closets.

Engineered for flexibility, the resistance-type equipment adjusts to build cabinets from 12 to 81 in. high. 9 to 36 in. wide and 13 to 25 in. deep. Adjustments from one cabinet size to another take about 10 minutes.

Multiple welder setup actually comprises four automatic spotwelding units. Each one closely interlocks with the other three through shuttles, electronic timing controls, relay switches and circuit breakers. One man is stationed at each machine.

Before the equipment's installation, it took 18 men one hour to make 140 cabinets. They used ten hand-operated weld guns and eight pedestal welders. The men had to square each cabinet with jigs, a time-consuming operation. In addition, problems of uniform quality beset the production line, for no two welders ever welded alike

New machine eliminates hand setting and

hand welding operations. Cabinet parts adjust automatically to perfect fit and squareness before equipment operates. Interlocked welders all fail safe, in that no one operator can start a new workpiece until the other three machines finish their own welding operations.

Squared, clamped pneumatically

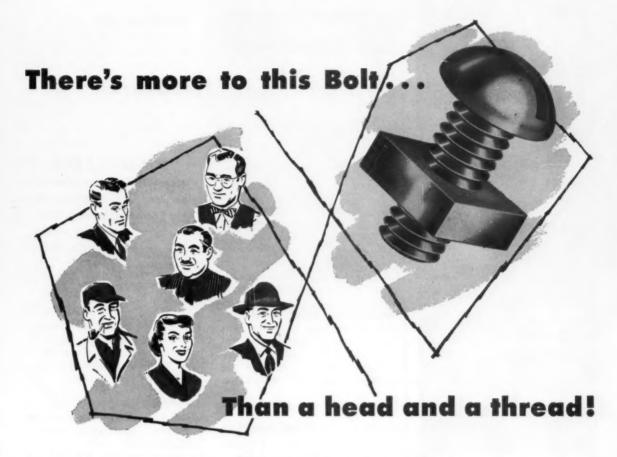
The first unit spotwelds door hinge reinforcements to cabinet sides. Then the man on No. 2 unit inserts these sides and a back into his machine. Pushing two start buttons automatically actuates pneumatically-operated position clamps. These hold workpieces square. At the same time, weld guns contact metal.

A Robotron electronic timer controls resistance welding on each machine throughout the conventional 4-part cycle. Squeeze time adjusts from 0.05 to 2.0 seconds. Weld and hold time can each vary from 0.05 to 1.0 seconds. At end of hold time, electrodes disengage automatically and return to rest position.

A relay switch then trips which energizes an air-operated shuttle to move the workpiece into the No. 3 unit.

After inserting the cabinet top, third operator pushes two control buttons. Again the machine and Robotron timer go into action and weld top to sides and back. Workpiece moves to the fourth welder as before.

At this station, operator slides the cabinet into the machine, and inserts the bottom. The machine resistance welds the bottom to sides and back.



Yes, there are many more things than meet the eye, even behind the most common type of bolt.

Such things as the *people* who engineer, manufacture, package, sell and ship these bolts.

Such things as the *pride* they take in turning out products that have a little extra something.

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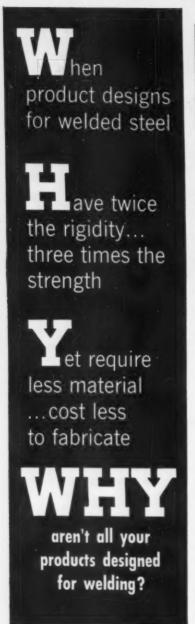


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"1035" SET SCREWS Cup point type, hardened and

August 9, 1956



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...yet this base is more rigid, holds closer alignment of machine spindles.



Photo courtesy Lees Bradner Company, Cleveland, Ohio.

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Revised Rubber Covered Hydraulic Hose Selector contains latest S.A.E. and industry specifications on hydraulic hose. Starting with any known factor, such as I.D., O.D., minimum burst, working pressure required or bend radius, a designer or maintenance man can use the selector to determine the proper rubber covered hydraulic control hose for his needs. Wiretex Hose Dept., Republic Rubber Div.

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Complete specifications and drawings of a gas-powered electric driven fork truck are contained in a four page brochure. Combining advantages of gas and electric power, truck's power plant consists of a gasoline engine which powers a generator which, in turn powers an electric driven motor. This eliminates battery charging, yet retains economy and simplicity of electric power, it says. No transmission or gear shifting is required, according to the company's brochure. Automatic Transportation Co.

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Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 97.

Can machinery

Company's complete line of can end and closure making machinery for medium and high speed can lines is described in a catalog just released. It describes firm's automatic high-speed strip feed press capable of 300 strokes per minute; high and medium speed strip feed presses and curling and stacking machines. E. W. Bliss Co.

For free copy circle No. 4 on postcard, p. 97

Tool bulletin

Bulletin gives specifications for precision sleeves, extension sockets, "use-em-up" sleeves, and turret tool holders. It points out precision that is built into tools made of hardened and ground stressproof steel. Scully-Jones and Co.

For free copy circle No. 5 on postcard, p. 97

Workbench machines

Colorful 20 page booklet discusses operations and uses of multi purpose power shop machines. Detailed features include: (1) mechanical movements of the radial arm machine, (2) advantages, (3) operation photographs of the basic machine and woodworking accessories, (4) safety features, (5) alignment and adjustment provisions and (6) available tools and attachments. Front and back covers picture machine housed in a modern workbench, offering dual advantage of floor space saving and a clear work surface for shop operations not involving the machine. DeWalt, Inc. For free copy circle No. 6 on postcard, p. 97

Tool products

Tool products catalog of deburring and chamfering tools gives product specifications and complete rundown. Tools promise elimination of "catch as catch can" methods. Features given: (1) Improved quality of finished work, (2) Uniformity in work performance, (3) Increased speed of production, (4) Reduced cost of manufacture, (5) Lowered inspection cost and rejection rate, and (6) Preferred customer acceptance. Nobur Mfg.

For free co, y circle No. 7 on postcard, p. 97

Paintstick markers

Catalog on company's complete line of Paintstik Markers gives information on 16 markers and intended purpose for each. Catalog gives information on use for hot or cold surfaces, colors available and holders. Markal Co.

For free copy circle No. 8 on postcard, p. 97

Recording equipment

Process data sheet describes new oxygen sampling and recording equipment designed for continuous O. analysis of openhearth waste gases. It presents a description of the sampling probe, steam jet sampling system, and the O2 Analyzer and Speedomax G recorder. Leeds & Northrup Co.

For free copy circle No. 9 on postcard, p. 97

Sintered Carbides

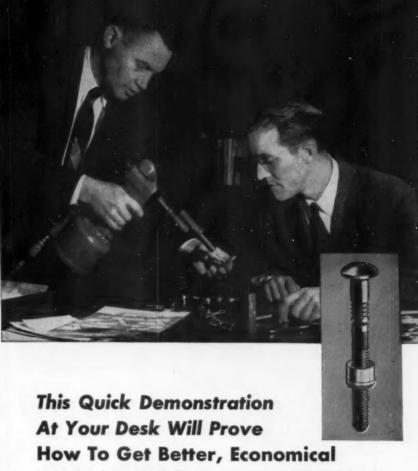
A specially designed carbide grade for machining steel from finishing cuts to medium roughing range is discussed in a four page bulletin. A graphical chart and performance report describe another new concept in sintered carbides. Firth Sterling, Inc.

For free copy circle No. 10 on postcard, p. 97

Brazing alloy, flux

Torch brazing with a simple torch and low temperature silver brazing alloy and low temperature flux are covered in a new four page leaflet. Typical examples are covered to show how metal joining can be speeded up and simplified while cutting costs. Handy & Harman.

For free copy circle No. 11 on postcard, p. 97



Fastening With Townsend Lockbolts

A few minutes of your time invested in watching a simple demonstration of a better fastening method may point the way to savings of thousands of dollars in assembly of your products. The Townsend lockbolt provides a quick method of producing tight, rigid fastenings that cannot loosen even under extreme vibration or shock conditions.

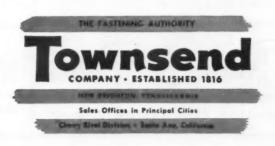
We would like to have a Townsend engineer demonstrate to you and others in your organization how these lockbolts combine the advantages of riveting and bolting-eliminate the disadvantages. He will show you that installation is fast-that fewer workers can complete an assembly in less time-you improve your productachieve a lower installed cost.

You will be able to see why the clamping action, or clinch, of Townsend lockbolts is higher than rivetsis more uniform than bolts and nuts. The demonstration will explain how the lockbolt fills the hole better than other fasteners-makes possible a more rigid joint and provides an effective liquid seal.

Townsend lockbolts are · available in steel and aluminum alloy, in 3/6", 1/4", 5/16" and 3/8" diameters, in grip length ranging up to 2", in various head styles.

For a demonstration on how to speed production, get tight, secure, permanent fastening with Townsend lockbolts write on your company letterhead to Townsend Company, P.O. Box 237-B, New Brighton, Pa.

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BUCKEYE ABRASIVE TOOL!

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runs like a vertical...

for 4", 5", 6" cup wheels for 5", 7", 9" sanding pads AND, IT'S QUIET!

Take hold of this newest Buckeye abrasive tool . . . it has the feel and balance, and the ease of handling you expect only in an angle tool. And—it has the gearless efficiency and direct air flow of a vertical tool.

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This NEW Buckeye abrasive tool is available in five speeds, comes complete with dead handle and guard. If you'd like more information, just write—now—for our Catalog A-10. If you'd like to see what this new tool can do on your work, just tell us so and we'll make the necessary arrangements—without obligating you at all.



producers of the world's first successful rotary air tools

FREE LITERATURE

Motor scraper

Design, engineering, construction and operating feature stories of a new motor scraper are contained in a 16 page two-color catalog. In addition to specifications, it includes photographs showing engine power train, steering, braking and other components. Construction Machinery Div., Tractor Group, Allis Chalmers Mfg. Co.

For free copy circle No. 12 on postcard, p. 97

Grinding wheels

Abrasives for grinding carbide tools are described in new literature. It contains information on standard wheel types and sizes. Plate specifications and blue print numbers of 23 plate mounted vitrified wheels for 30 grinding machines made by 16 different manufacturers are furnished. This is followed by tips on grinding carbide tipped tools. Robertson Mfg. Co.

For free copy circle No. 13 on postcard, p. 97

Process equipment

Large scale and special purpose process equipment for the chemical, textile, plastic, rubber and allied industries is reviewed in a new brochure. Design and construction details are given for intensive mixers, liquid blenders, dissolvers, kneading machines, pressure filters, ball mills, conical blenders, horizontal blenders, quick-opening doors, pressure vessels, and other types of process equipment. Dravo Corp.

For free copy circle No. 14 on postcard, p. 97

Thermocouples

Noble Metal Thermocouples, written by H. E. Bennett, F.I.M., underlines importance of the thermocouple as an aid to metallurgical industry and research. After brief surveys of high temperature measurement methods and thermocouple development, booklet deals with applications of the platinum metal thermocouple and with methods of calibration. It covers properties of platinum-group metals. Johnson, Matthey & Co., Inc.

For free copy circle No. 15 on postcard, p. 97

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What manufacturer doesn't want to cut costs and improve his product? The big question is how!

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WHAT ARE AMWELD FLASH WELDED RINGS?



They are rings formed, flash buttwelded, and shaped into the finest quality circular weldments available.



They are rings that offer savings of critical materials. Bar stock formed and flash welded uses considerably less material than rings made by other methods.



They are rings that offer additional manufacturing savings. Since the rings are closer to the desired finished cross section, it is less expensive to machine them to a final dimension. Oh yes, Amweld will machine them for you.



They are rings made by a company with experience in design. We can help you select a mill-rolled or extruded shape that is even closer to the finished ring dimension. This can give you additional savings.



Yes, Amweld flash-welded rings can give you extra profit from savings on material and machining time. Amweld rings can be made of most weldable ferrous or non-ferrous metals in sizes from 4 to 96 inches.



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FREE TECHNICAL LITERATURE

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

This section starts on p. 92

Barrel finishing

Complete barrel finishing in one unit is claimed in a new data sheet. In a single, compact, versatile machine, a barrel finishing cycle from raw part through to a finished piece is said to be performed. It is described as carrying out the jobs of: deburring, micro-finishing, speed polishing, grinding, honing, coloring and burnishing. It comes complete with built-in top parts pan, screening unit and media storage pan for self-contained rapid separation. Speed-D-Burr Corp.

For free copy circle No. 16 on postcard

Cutting machines

Folder cites increased production, flexibility and mechanical accuracy of portable flame and shape cutting machines. Both machines are pictured in photographs. Operation and construction features are reviewed. Construction features and design are covered on base, post, arm casting, controls and template follower. Assessories are listed. Victor Equipment Co.

For free copy circle No. 17 on postcard

Thickness tester

Written in simple form for quick reading and easy reference, an 18 page booklet gives detailed information on firm's electronic thickness tester. It describes the tester as an instrument for measuring thickness of metallic films by means of the anodic solution method. Questions and answers are given that cover most asked queries concerning the tester. A complete index covers everything from accessories to wire. A partial list of users is also included. Kocour Co.

For free copy circle No. 18 on postcard

Good shopkeeping

Cartoon-illustrated, easy to read and understand booklet on "Good Shopkeeping" offers a rib-tickling. brief but interesting and informative answer to bad shop conditions. Printed in pocket size form by a manufacturer of water soluble metalworking solutions, it outlines a program of healthier, cleaner plants, machines and shop workers to increase production efficiency. Only axe ground is booklet's statement that coolants aren't to blame for "Monday morning odor." It accuses dirty machines, charging, "Clean those machines thoroughly inside and out . . . and keep them clean . . . and you'll find those coolants staying sweet smelling for weeks." Firm's coolants, it says, do not turn rancid and smelly. It even has a word for the wives who do the laundry. F. E. Anderson Oil Co.

For free copy circle No. 19 on postcard

Electric heaters

Revised catalog describes industrial electrical heating units and devices. It contains information and design selection charts on strip heaters. natural and forced convection air heaters, oven heaters, immersion heaters, cartridge heaters, melting pots, industrial hot plates, and heater control equipment. Westinghouse Electric Corp.

For free copy circle No. 20 on postcard

Storage racks

Newest literature of all storage racks produced by one firm is now available. It comes in a plastic bound catalog of standard size for convenient filing. American Metal Products Co.

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Stock list

Two hundred page catalog containing approximately a thousand photographs and numerous specification and data lists covers a complete list of machine tools. Published in Great Britain, it includes a long list of machinery for cutting and forming sheet metal, machining wood, making tin boxes, presses of all kinds and more. Catalog speculates that the firm has possibly the largest stocks in Europe of machines for the engineering industry. Machine tools of all types and sizes are cataloged. F. J. Edwards, Ltd.

For free copy circle No. 22 on postcard

Production lathe

Eight pages of information containing many photographs explains company's production lathe. "Today's lathe for Tomorrow's production," is how the booklet describes it. Illustrations and text cover: chip disposal, axle production, slides, quill, micro slides, top slides, headstock, tailstock, clutch and brake and typical parts machined on a production basis. A page of specifications on the spindle, top carrage, rear slide and tail stock are given. Burleigh & Stocker Machine Tool Co.

For free copy circle No. 23 on postcard

Furnace bulletin

Furnaces with an operating range from 1400° to 1750°F are reviewed in a new bulletin. Booklet says they can be used equally well for gas carburizing, clean hardening, dry cyaniding, carbon restoration, homogeneous carburizing, clean annealing, oil quenching or marquenching. It illustrates these suction radiant tube fired units and the available mechanized systems. Surface Combustion Corp.

For free copy circle No. 24 on postcard

Tooling plastics

Aircraft and automotive tooling plastics are covered in a folder. In addition to an Epocast resin easy selection chart, literature explains resins for high temperature, surface coating, casting and laminating. Hardeners are also covered. Furane Plastics, Inc.

For free copy circle No. 25 on postcard

Tool catalog

Just off the press is a new 28 page catalog describing all types, uses and advantages of subland tools. Because the term subland is not always clearly understood, such subjects as "What are Subland Tools?", "Why Subland Tools?", and "Where Sublands?", are discussed. Descriptions are included on different types and operations to combine on a single tool. Also described is firm's line of off the shelf sublands. Mohawk Tools, Inc.

For free copy circle No. 26 on postcard

Silicone rubber

Stock item silicone rubber and allied products available through firm's distributors are described briefly in a newly published brochure. It says this represents a major departure in the silicone rubber field; "the first real attempt to remove silicone rubber products from the custom production category and make the most useful silicone rubber items available from the shelf." Price and distributor lists accompany it. The Connecticut Hard Rubber Co.

For free copy circle No. 27 on postcard

Unified threads

Unified Screw Threads are quickly explained in simple language and illustrations in a four-page folder. It cites profile origins of the Unified Threads adopted in 1948 by the U. S., Britain and Canada, minor changes in threads per inch from American Standards, and advantages of thread tightness and interchangeability. Cleveland Cap Screw Co.

For free copy circle No. 28 on postcard

Padlock catalog

Padlocks to meet every need are described in a completely new 20 page catalog. Of modern design, this 1956 edition is described as "a revolutionary departure from the usual padlock catalog." Various styles and sizes are arranged in a unique manner. Actual size illustrations of the company's entire line are shown. Included for the first time is a section on special long shackle padlocks. Master Lock Co.

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ALCO | Makes Steel to Assure You of Quality in ALCO FLANGES

Steel made in ALCO's own open hearth furnaces is your guarantee of the exact metallurgy for your flange requirements. You benefit because ALCO controls deoxidation, grain size and creep properties, meets individual tensile requirements, provides proper grain flow. You save because your welding procedures can be standardized and because exact steel chemistries for the most economical preheat and postheat procedures are provided.

ALCO produces special steels not listed in standard specifications as well as steels to meet ASTM, AAR, ASME, AISI and MIL specifications. As an additional help, ALCO specialists will confer with you on proper steel selection.

For a complete look at ALCO flanges and welding fittings, send for ALCO's new 54-page catalog. It describes ALCO's production facilities and the wide range of sizes and types available.

PRODUCTS, INC.

ALCO PRODUCTS, INC., P. O. Box 1065, Schenectady 1, N. Y.

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Precision machining is done by skilled craftsmen in our modern machine shop. Send your blue prints for quotation.



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For finer finish, long life and greater tonnage, specify Red Circle Rolls.



CONTROLS: Automatic Feeding

Semi or fully automatic system proportions 43 feeders while making a permanent formula record . . . Operator merely sets dials, pushes buttons . . . Controls then take over.

Complete recording of formula information, control of 43 feeders and electronic interlocking of a complex proportioning system are handled automatically by a new electronic measuring - weighing system.

Complete and Impressive

The system recently completed by Richardson Scale Co., Clifton, N. J., is described as one of the most complete and impressive of its kind ever developed. The setup is designed for proportioning grain and feed formulas in a large feed mill. It includes a printing mechanism interlocked with the automatic panel. This printer records complete formula data for each batch proportioned. This is electronically transmitted through the control panel from actual weighings from feeders.

Gives Permanent Record

Information is recorded by numerical code and includes formula number; time, month and day of formulation; final cutoff point of each feeder; feeder identification number; total cumulative weighing of each scale; and grand total of all three scales. This gives the user a permanent record of all formulas proportioned, for checking formula discrepancies and for inventory control.

The panel has push-button control. Remote indicators for each scale appear on the panel's face. The first scale system can automatically proportion any 10 ingredients from 23 feeders; the second, any seven of 10; and the third, any one of 10.

Interlocked Scales & Feeders

When installed, it will be fully interlocked with scales and feed-

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 97. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

ers for accurate weighings and recording. Electronic controls include material shortage interlocks, incorrect weight selector setting interlocks and standard proportioning interlocks.

Full or Semi-automatic

The system is designed for fullautomatic or semi-automatic operation. Under full-automatic op-



Set dials, push button; panel controls and records 43 feeders.

eration a formula is set up on the panel's control dials; the system can then be set to repeat the formula automatically as many times as desired. As a semi-automatic operation the operator sets the control dials each time a formula is fed into the system. The machine does the rest.

Metallurgy:

Naval Research will hold molybdenum symposium

Molybdenum and molybdenum base alloys will be thoroughly discussed at a two day symposium to be held in Detroit by the Office of Naval Research on September 18 and 19. The Navy sponsored gathering will meet at the Rackham Memorial Bldg. of the Engineering Society of Detroit to present an up-to-date picture on the status of molybdenum and its alloys as structural materials.

Will Deliver 15 Papers

Some 15 papers are scheduled to be delivered including: "Molybdenum as a Structural Material." "Preparation and Fabrication of Molybdenum and its Alloys," "Metallurgy of Molybdenum and Molybdenum Base Alloys" and "Molybdenum Alloys in Gas Turbine Applications." Following the meeting, Climax Molybdenum Co. will hold an open house at its Detroit laboratory for those interested in the arc-melting and working of molybdenum alloys.

Although the Office of Naval Research has extended a broad invitation to all interested parties. attendance is limited by the auditorium's seating capacity. Therefore, they have set-up an "invitation only" admittance policy. Applications for invitations are presently being accepted by J. J. Harwood, Head, Metallurgy Branch, Office of Naval Research, Department of the Navy, Washington 25, D. C.

Fabricating:

Spraywelded thermowells last longer, refinery finds

Longer life for thermowells operating in a catalyst have been reported by an oil refinery that has found a new fabrication method. In addition, they boast of an initial cost slash by 75 pct. Thermowells made of black pipe sprayed

Ask how to

Standard cut costs with conveyors



Parallel roller conveyor lines facilitate movement of large molds to pouring area. Note simple right angle transfer device.

Job-tailored conveyor systems speed, simplify foundry work

OOD foundry practice requires smooth handling of molds and cores to reduce losses due to "shifting" or "collapse."

This can be achieved with Standard Gravity Roller and Power Conveyors. Standard's 50 years' experience in engineering and manufacturing foundry conveyors can be valuable to you.

Before you embark on any modernization program it will pay you to call STANDARD CONVEYOR COMPANY, General Offices, North St. Paul 9, Minn. Sales and Service in Principal cities.



Steel foundries handle cumbersome molds easily on simple low cost roller conveyors. Special design shielded bearings for rough foundry use give longer life, low maintenance.



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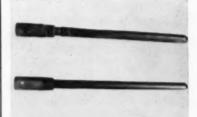
Sales and Service in Principal Cities.



with Colmonoy No. 6 hard facing alloy, the refinery reports, last nearly five times as long as high alloy units operating in similar service conditions.



In a typical operation, thermowells were put in refinery service under identical conditions. The part made of a nickel-base non-



New thermowell (top) outlasts nonferrous one and costs 1/4 less.

ferrous alloy was worn 3/16 in. on one side after six months.

The thermowell fabricated of black pipe spray welded with a 1/16 in. coating of Colmonoy No. 6 hard facing alloy was then used. This material is a nickel-base alloy containing chromium borides. Cost of this part, the report states, was one-quarter less.

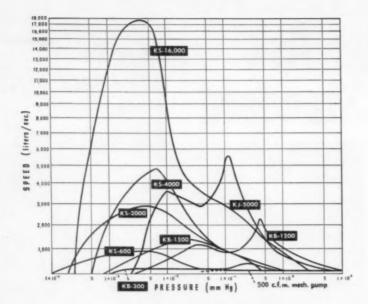
Used 18 Months More

After six months, the hard-faced part showed 0.025 in. wear on one side. It was then put back in service with its position reversed where it operated for another six months. Following one year of refinery service, it has worn 0.055 on the diam. Its condition was such as to permit further use for an estimated additional one to $1\frac{1}{2}$ years.

Chemicals:

Methylene chloride vapor spray removes lacquer

Methylene chloride is often utilized as the main constituent in formulating paint and lacquer removers. It is described as an excellent solvent for many organic constituents of paints and lacquers. One of the advantages of



If you're interested profitable in vacuum metallurgy...

consider these CEC vacuum pumps

Models Where they are being used

KB-300 Titanium Sponge Production and Carbide Sintering

KS-600 Up to 50 lbs. Melting and Casting

KB-1200 Ib. Consumable Electrode Arc Melting

KB-1500 Multi-Batch Carbide Sintering

KS-2000 Up to 300 lb. Melting and Casting @ 1 to 10µ pressure

KS-4000 Up to 500 lb. Melting and Casting @ 1 to 10µ pressure

KJ-5000 Up to 1000 lb. Melting and Casting @ 5 to 25µ pressure

KS-16000 Up to 2000 lb. Melting and Casting @ 0.6 to 10μ pressure

Vacuum-melted metals and alloys are past the pilot-plant stage—ready for profitable mass production.

Vacuum-melted metals are purer, tougher, and more uniform than metals melted in standard furnaces. Because that's true, the market for vacuum-melted metals is expanding rapidly. New uses for these superior metals appear daily.

Our aim is to help you take advantage of this situation. We supply production vacuum equipment such as the pumps briefly described above. Better yet, our engineering staff is ready to work with your metallurgical engineers to find answers to your particular problems. We are equipped to design and build a variety of furnaces ranging from

and build a variety of furnaces ranging from laboratory units to 1000-pound capacities and higher.

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methylene chloride over other types of solvents is that it is non-flammable and non-explosive under normal conditions of temperature and pressure. It is one of the least toxic of the commonly used industrial solvents. However, the main disadvantage of methylene chloride is the high volatility of the solvent.

Used As Lacquer Stripper

Lycoming Div. Avco Mfg. Corp. first attempted using methylene chloride as a lacquer stripper in a converted vapor spray degreaser. It was first determined by process engineering whether or not methylene chloride would strip a particular type of lacquer from aluminum and steel. Parts are partially stopped-off with lacquer prior to partial plating with silver in the case of steel parts and electroless nickel on aluminum pistons. For test results, panels were dipped into the stopoff lacquer either once or three times. If they were dipped more than once, then they were allowed to air dry 1/2 hr between coats. Panels were baked at 150°F for an hr in an oven. Lacquered panels were then subjected to the various solutions used in the plating cycle in order to simulate as closely as



Aircraft engine parts are lifted from methylene chloride.

possible the operations that parts would be subjected to in the shop. The panels were then stripped of lacquer using methylene chloride at room temperature or at its boil-

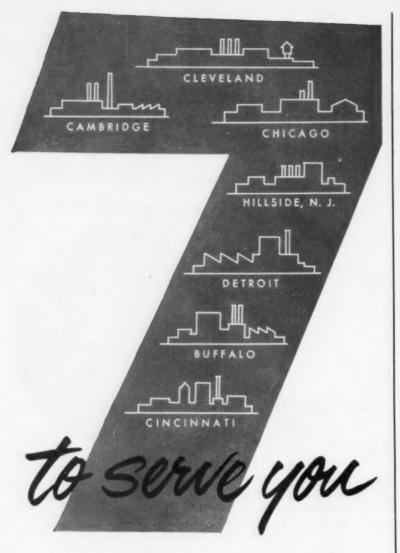
ROUND-SOLID-TOUGH TRU-STEEL

consistently-from one lot to the next-has everything you expect and pay for in premium shot



When you pay for premium material you expect premium performance—consistently. In TRU-STEEL you get it—consistently. Precision control of manufacturing processes, unsurpassed plant facilities, and the know-how of specialists whose only business is the manufacture of steel shot,—assure it. Tru-Steel is consistently round and solid, without hollow or stringy shot that reduce life cycle. Tru-Steel has the consistent hardness and chemistry from lot to lot that eliminates monthly variation in blasting costs. And,—it's superlatively graded; no other can match its uniformity.





A call to any one of our seven warehouses will get you speedy service on your order... whether it's for alloy steel bars, billets or forgings, in any size, shape or treatment you need.

All seven warehouses are located in principal industrial areas. Each is modern and well-stocked, and staffed by expert metallurgists.

Call now if you need our own HY-TEN steels - "the standard steels of tomorrow", or standard AISI or SAE grades.

Or write for *free* copies of Wheelock, Lovejoy Data Sheets. They contain complete technical information on grades, applications, physical properties, tests, heat treating, etc.



In Canada: Sanderson-Newbould, Ltd., Montreal and Toronto

WHEELOCK, LOVEJOY & COMPANY, INC.

126 Sidney Street, Cambridge 39, Massachusetts

ing point and with a combination of vapors and boiling methylene chloride.

Using cold methylene chloride. one coat was said to have stripped in two minutes, and three coats were stripped in seven minutes. When panels were subjected to both vapors and boiling methylene chloride, stripping time was reported cut in half. There was no attack on the steel or aluminum.

Chemical Boils At 104.2°F

It was then decided to try methylene chloride in a vapor spray degreaser that was formerly used for trichloroethylene. Since methylene chloride boils at 104.2°F it was necessary to change thermostatic settings and steam pressure on the degreaser. The thermostatic setting in the liquid area was lowered to 105°F and the steam pressure in the heating coils was lowered to one psi. The vapor temperature regulation bulb was changed to the 95°F range as a safety precaution in case of failure of the cooling coils to condense the vapors. Since the degreaser had six cooling coils it was decided that this was sufficient to condense the vapors.

Welding:

Resistance heating element makes pipe welds easier

Preheating or stress relieving pipe welds easier, is reported as less expensive and more precise with a new electrical resistance



Shipping wrapper removed, heating element is ready for use.

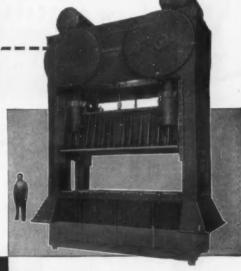
heating element. The new method also is said to require less time

Less Down-Time With CLEVELAND Presses

Powered by the Clutch that's



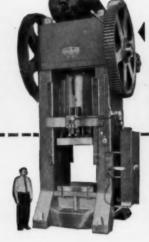
"Revolutionizing" Production



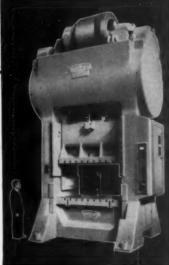
Cleveland S 4-600-204-102 Four Point Press, 40" stroke, 102 x 204" bed area,

600 tons capacity.

Cleveland S 1-800 Single Crank Press double geared, 16" stroke, 48 x 42" bed area, 800 tons capacity.



Cleveland S 2-350-60-42 Double Crank Press, 8" stroke, 42 x 60" bed area, 350 tons capacity.



Why not investigate the production economy built into every Cleveland Press Equipped with our patented Cleveland Drum Type Clutch. Won't you let us give you the complete Cleveland story? Write or call today!

It doesn't matter which of the 11 types of Cleveland presses best meets your requirements. For as long as it is equipped with our patented Cleveland Clutch, you can be confident that you are getting a press that will give you the best performance obtainable. This proven clutch unit assures minimum down-time, positive, fast control and lower operating costs.

Designed with a minimum number of parts, the patented Cleveland Drum Type Friction Clutch requires only minor adjustments. There is less chance of failure. Its light-weight construction reduces horsepower required for operation. Operational studies prove it to be completely dependable.

CLEVELAND
PUNCH & SHEAR WORKS CO.

Established 1880

POWER PRESSES - FABRICATING TOOLS



CITY FOUNDRY DIVISION - SMALL TOOL DEPARTMENT





and labor, to the element user.

Basic feature of the technique developed by the Arcos Corp., Phila., is a length of small diam resistance wire. The wire's full length, except for several inches on each end, is strung with ceramic ball and socket beads.

Each coil end is formed into a small ring. After wrapping the coil around the welded pipe section for stress relieving, the ends are connected to the terminals on a welding machine.

Thermocouples Under Coil

Thermocouples are inserted under the coil and connected to an indicating pyrometer. After connections have been made, the treated section is wrapped with an asbestos cover.

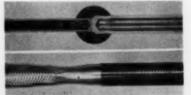
When the hookup is completed, the welding generator is set at the amperage rate calculated to produce the necessary heat. The pipe thickness, the amount of heat required, and the general conditions affecting the buildup of heat are expected to vary from job to job.

As soon as the desired temperature is reached, it is adjusted manually to hold the correct temperature.

Joining:

Aluminum-copper electrical connector reported better

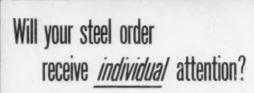
A new connector for joining aluminum to copper electrical conductor in severe natural environments has been found to perform satisfactorily in areas where other



Joined cups (top) and 1.25 in. weld after 15,000 psi heat.

available connectors have failed in a relatively short time.

Developed by the Kaiser Aluminum & Chemical Co., in one form



Although many companies are having trouble securing the steel they need from warehouse sources, of one thing you can be sure . . . Levinson people will never stop knocking themselves out to help their customers solve their material problems.

Sometimes we can pick up part of what you need some other place or perhaps figure out a suitable substitution . . . or maybe our engineers can plan a splicing or welding job that will fill your needs. We may not have the answer to your problem in our hip pocket, but you'd be surprised how often we can help work it out.

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it consists of a deep aluminum cup and one of copper butt-welded together at the closed ends and hermetically sealed in a rubber ball and cement system. It reportedly eliminates two principal problems, galvanic corrosion and thermo-elastic ratcheting, in joining the two dissimilar metals. It is designed for use particularly in marine and other highly corrosive atmospheres where other connectors have failed.

Extensive Field Tests

Extensive field tests in severe marine and industrial environments and accelerated laboratory tests have reported in all cases that it will outlive the conductor it joins.

Conductors are normally attached by the compression barrel method. However, a combination of compression barrel and split bolt connector has also proved satisfactory, and a number have been produced in open tip and in large size conductor-to-terminal designs. These are said to indicate that it lends itself to almost any method required for attachment to conductors and terminations.

Insulation:

Organization offers hints on supporting insulation

Block-type thermal insulation has long life, low conductivity, and resistance to compression and mechanical damage, the Magnesia Insulation Manufacturers Assn. observes. However, in the design and application stages, consideration should be given supporting methods, MIMA says.

Applied By Others

This problem is generally encountered on the under and vertical sides of vessels and breechings, and on conical or convex surfaces. Similar techniques can be employed whether insulation blocks are 85 pct magnesia, diatomaceous silica, calcium silicate or expanded silica for medium and high temperature use.

Most insulation anchor block specifications stipulate that these should be applied by "others" (i. e., equipment manufacturer, metal working contractor). When stud welding is employed, most insulation contractors have the necessary stud application equipment, particularly since the development of stud welding processes for lighter gauge metals. It is important, MIMA points out, to coordinate equipment and insulation specifications to assure availability of insulation anchors and to designate responsibility for affixing them.



Clips secure insulation blocks impaled over stud welded pins.

Types of anchors and securements to be used depends on equipment to be insulated and other conditions of construction or operation. In general, there are three types of anchors: continuous angle irons, spot anchors (clips, hex nuts, etc.) and welded studs or pins.

Continuous Angle Irons

Continuous angle irons are employed most frequently on cylindrical vessels of large diameters. On horizontal tanks, for example, the angle irons are welded to the underside and spaced 120° apart. equally distant from the bottom center. Insulation blocks are secured by metal bands affixed to previously drilled holes in the projecting angle iron. Six bands per three ft insulating block are recommended for the lower third of the tank, and three bands per block for the rest of the circumference.

On large vertical vessels, angle irons are welded vertically at intervals, of approximately 20 ft and blocks are secured with bands.



CONCO ENGINEERING WORKS

Division of H. D. Conkey & Company 15 Grove Street, Mendota, Illinois

AFFILIATES: Conco Engineering Works-Domestic Heating Equipment e Conco Building Products Inc., -Brick, Tile, Stone

Stamping:

Tungsten carbide dies last 18 times as long

Specifying of tungsten carbide for many applications where part quality, fewer rejects, and increased efficiency were prime consideration, rather than just a long production run, has paid dividends for the Beaver, Pa., plant of Standard Control Div. of Westinghouse Electric Corp.



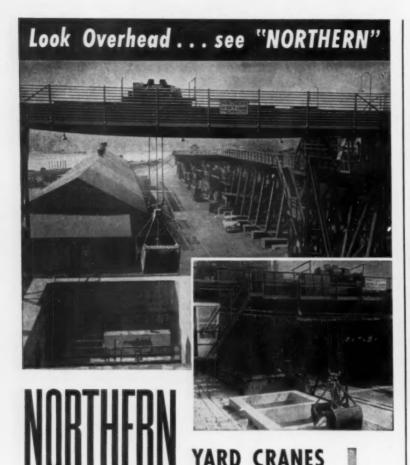
Die turns out 18 times more than former die before sharpening.

The Beaver plant produces a wide range of industrial circuit breakers. Some of the parts are fabricated from mild cold rolled steel. Others are stamped from tough stainless or from hard, abrasive, electrical silicon sheet steels.

Until the comparative recent advent of carbide dies it was necessary to make the dies of high carbon, high chrome or high-speed steel.

After studying the situation from a cost as well as a quality production standpoint, Westinghouse tool engineers consulted with Oberg Mfg. Co., Inc., Tarentum, Pa., designers and builders of tungsten carbide dies, to determine the economic advantage of using tungsten carbide for their more difficult stamping problems.

A progressive carbide die Oberg designed and built, although costing at that time three times as much as a tool steel die, now turns out more than 18 times as many laminations between sharpenings.



are built for rugged service

All Northern Overhead Electric Traveling Cranes are designed and built to provide the maximum in dependable operation under the most rugged conditions.

High efficiency and minimum maintenance are assured by close tolerance machining of all mechanical parts with turned and ground shafts, press fits of gears, wheels and bearings. Brakes are chosen to allow for extreme overload conditions. Extra heavy structural sections and rigid construction of girders with end trucks insure lateral stiffness, minimum vertical deflection and safe operation when the crane travels at full speed. Heavy duty type motors with anti-friction bearings are combined with especially selected control equipment to assure fine handling.

In plants where bulk material handling is required, as in the steel plant shown above, Northern cranes are a preferred investment for safety, dependability and efficiency.

Write for Bulletin SE-108

MATERIAL HANDLING EQUIPMENT BY

NORTHERN

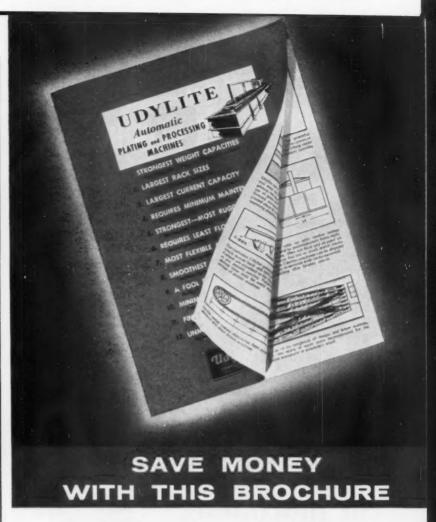
NORTHERN ENGINEERING WORKS
210 CHENE ST., DETROIT 7, MICH.

New Books:

"How To Get Industrial and Business Publicity," by C. E. St. Thomas, advertising and sales promotion manager, G.E.'s Carboloy Div., starts off with the bold statement, "Industry and publicity were wedded in a shotgun ceremony just before the turn of the century." The book covers background and a step by step treatment of efficient and effective firm publicity. How to Organize for Publicity, Forms and Working Procedures, How to Release Publicity, Personal Contact with the Press, Measuring and Reporting Publicity, Relationship of Publicity to Advertising and Sales. are some of the chapters. Available at book stores, \$5.00. Chilton Co., Philadelphia 39, Pa.

"Vacuum Technique," by Prof. Dr. R. Jaeckel of Bonn, is in German and contains 65 pages with 81 illustrations. The cost of this booklet is DM 20.80 for members of the Dechema and DM 26 .- for non-members, plus DM 1 .-- for packing and postage (about \$6.70 at the current exchange rate). The work includes a brief survey of basic principles, units and mathematical symbols, exhaustive description of apparatus and equipment used for creating and measuring vacuum, basic calculations for vacuum plant, prosecution of experiments and processes in a vacuum, a bibliography and index. Obtainable only from Dechema Deutsche Gesellschaft für chemisches Apparatewesen, Frankfurt am Main, 7, Postfach.

"Analysis and Control of Black Chromium Plating Solutions" is discussed in a report of Army research. Two procedures for analysis of a mixture of chromic and acetic acids were found usable. One technique is a modified steam distillation and subsequent titration with a sodium hydroxide solution which gives good results for acetic acid but is time-consuming. The other involves potentiometric titration. 19 pp. Fifty cents from Office of Technical Services, U. S. Dept. of Commerce, Wash. 25.



Get the facts you should know about Automatic Plating Machines

Let us show you how Udylite Full Automatics give you more production plating per square foot. How racks of extreme depth can be used. How lifting, horizontal movement and lowering of racks is done smoothly, without jar or jerk by hydraulic power with separate speed controls for each movement. Why Udylite machines can be shipped by rail or truck, assembled on their own base and with tanks mounted, saving valuable erection time in your plant. And, many other factors to check before the purchase.

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WORLD'S LARGEST PLATING SUPPLIER

"ASTM Standards on Light

Metals and Alloys, Cast and

Wrought" is 276 page, third edition including specifications and methods of test for light metal alloy die castings and those for aluminum wire and cable for electrical purposes. Several methods on methods of testing and chemi-

cal analysis of metals as well as specifications for aluminum and aluminum alloy arc-welding electrodes and for brazing filler metal

have been included. Standards in-

clude ingots, castings, bars, rods,

wire, forgings, pipe and tube, sheet

and plate, wrought products for

electrical purposes filler metal,

electroplating, and general meth-

ods of test. \$3.50. American So-

ciety for Testing Materials, 1916

Race Street, Phila. 3.

THE TREND IS TO THOMAS



- Machine is shown tooled for flats. Modern Thomas design makes this machine a compact, space-saving, self-contained, unit for shearing or punching.

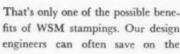
production

This all-steel Thomas machine is available in capacities of 50 through 600 tons. It can be supplied with tools for shearing flats, rounds or angles, or fitted with punching tools.

PITTERBREN 23. PA

Punches · Shears · Presses · Spacing Tables · Benders

cut machining costs ...



weight of component parts, improve the finish and help reduce the production cost of the end product.

With 100 presses and over 70 years of metalworking experience - WSM can give you fast, competent service on light, heavy or deep drawn stampings . . . can help you compete in today's critical market for better products at lower cost.



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"Techniques of Plant Maintenance & Engineering-1956," reports proceedings of the conference held with the Plant Maintenance & Engineering Show and contains the texts of 16 papers, summaries of 15 roundtable discussions and answers to approximately 1100 specific questions. Seventh in a series. 248 pp. 110 illustrations, charts and tables. \$10.00 postpaid. Clapp & Poliak, Inc., 341 Madison Avenue, New

York 17. "Casting Kaiser Aluminum" contains extensive information on all phases of aluminum casting. Progressive foundry practices are fully treated with a complete analysis of aluminum casting alloys and their characteristics. While publication is designed primarily for foundrymen, its scope extends to any metal fabricator seeking comparative information about the possible application of aluminum castings (i.e.: design and production engineers are able to determine type of casting applicable to specific products or assemblies). Comparative and descriptive material on the various casting methods are discussed. Copies obtained free when re-

quested on company letterhead, or at a cost of \$5 for personal libraries. Technical Editor, Kaiser Aluminum & Chemical Sales, Inc.,

919 North Michigan Ave., Chicago.



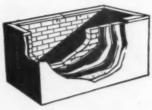
"The Mechanical Properties of Wrought Phosphor Bronze Alloys" is a 120 page paper showing effect of cold-working on the mechanical properties of a series of eight phosphor bronze alloys in two conditions in the form of cold-rolled strip with varying tin content from 0.5 to 10 pct. Electrolytic tough pitch copper strip similarly treated is included to provide a base for evaluating the effectiveness of the tin additions. Mechanical properties-including tensile strength, proportional limit, yield strength at both 0.01 to 0.2 pct offset, modulus of elasticity, elongation, bending fatigue characteristics lifetimes ranging from 100,000 to 100,000,000 cycles and the Rockwell Hardness (B and 30 T values) -are reported for six different tempers of each of the materials. \$3.00. American Society for Testing Materials, 1916 Race Street, Phila. 3.

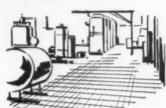
"Zirconium-Technology and Economics," is a 125 page report based on proceedings of a two-day Forum meeting. It includes papers and discussion on chemistry and production of metallic zirconium, fabrication, properties, corrosion behavior, alloys, supply of raw and refined materials, commercial products available, future AEC and industrial requirements. The meeting was held under the sponsorship of the Subcommittee on Process Metallurgy and Fabrication of the Forum's Industrial Committee on Reactor Materials. \$3.00. Atomic Industrial Forum, 260 Madison Ave., New York 16.

"Nickel." One of the National Security Resources Board's Materials Survey series, this volume presents a broad picture of the importance of this mineral: the many uses of nickel, its production, mining and milling methods, occurrence of the world's deposits. United States resources, world production, possible new sources of supply, and many other points inherent in a detailed study of such a vital material as nickel. 316 pp. Catalog No. I 28.97; N 53, \$2.00. Supt. of Documents, Govt. Printing Office, Wash. 25.

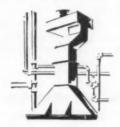
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Tear out this ad and check the block where corrosion protection is most needed in your plant. You will receive a complete bulletin giving all technical information.

- CEMENTS LININGS
- PROTECTIVE COATINGS RIGID PLASTIC STRUCTURES

with ATLAS TANK LININGS for steel or concrete tanks. A complete corrosion-proof covering system from primer to protective brick sheathing.

with ATLAS CORROSION PROOF CEMENTS for the most severe conditions. Protection against acids, alkalies, salts, solvents and other corrosives.

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with ATLAS RIGID PLASTIC STRUCTURES for tanks, fume exhaust duct work and complete pipe systems. Fabricated of highest quality corrosion proof plastics.

TECHNICAL REPRESENTATIVES THROUGHOUT THE UNITED STATES



New and improved production ideas, equipment, services and methods described here offer production economies...for more data use the free postcard on page 97 or 98.

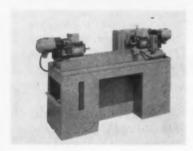


Portable rack holds complete diesel engine assembly

This new portable diesel engine parts rack is specially designed to accommodate all three Detroit diesel engines. It is adaptable to other engines, transmissions, torque converters and differential assemblies. Recommended for service shops doing engine overhaul, its erected dimensions are: 81 5/16 in. long x 40 in. wide x 53 in. high. Among features: (1) crankshaft held safely and securely. (2) parts protected by rubber or plastic

guards where necessary, (3) over 60 sq ft of shelf space eliminates stocking or piling of precision parts, (4) "knocked down" shipment for low freight rates, (5) two roller bearing rigid and two ball bearing swivel six in. wheels to provide easy maneuverability, and (6) assembly ease. It holds all parts of a complete engine assembly, the maker says. Kent-Moore Organization.

For more data circle No. 30 on postcard, p. 97

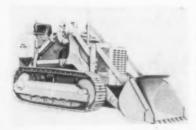


Cut, mill, tap opposite part ends at same time

Double end-cutting operations are handled by a series of standard production machines now announced. Equipment can drill, tap, ream, thread, bore, mill and perform other end-cutting jobs. Maker supplies machine complete with air plumbing, electric power wiring and cycle control systems. User

furnishes and mounts fixtures and tooling to start production. Drill units employ shop air pressure for thrust, and hydraulic pressure for spindle travel. Travel, feed and stroke all adjust both in advance and retract motions. Hause Engineering.

For more data circle No. 31 on postcard, p. 97

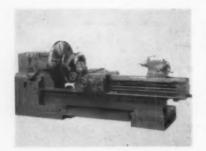


Buckets offered as attachments to handle tough jobs

Designed to fill specialized needs on tough jobs, these new buckets are being offered as attachments for firm's line of Traxcavators. They are constructed of heavy. abrasion resistant steel and equipped with welded-on tooth adapters and removable tooth tips.

Buckets are considered ideal for allaround use in rock and similar materials. They range in capacity from one to 2½ cu yd. New buckets retain large rocks while letting dirt and small rocks sift out. Caterpillar Tractor Co.

For more data circle No. 32 on postcard, p. 97



Sliding bed gap lathe gives twice normal swing size

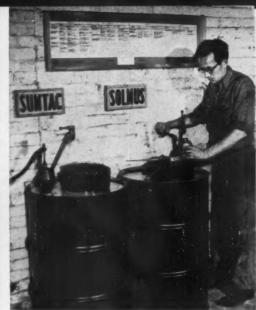
With sliding bed extended, this 16 in, sliding bed gap lathe is said to give twice normal swing size, more than 50 pct greater distance between centers. With bed closed, it functions as a regular engine lathe. This is described as ideal for turning unpredictable extremes encountered in maintenance and job

shop work. It handles large diam work, extra long pieces and parts with large projections. Its special bed slides open to form a gap allowing it to change shape to suit odd-size parts. Swing size is said to no longer be a limitation. The R. K. LeBlond Machine Tool Co.

For more data circle No. 33 on postcard, p. 97

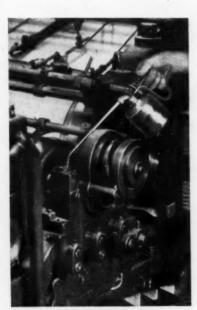


Seven Products Replace Twelve. Sun representatives show how Sun's plan of industrial lubrication and preventive maintenance benefit management.



Over 70% of all plant equipment is now lubricated by only two moderately priced oils.

How A Sun Engineer Helped Cut Lubrication Costs by 15%... Reduce Oil Inventory by 42%



Maintenance Is Easier. Sun's plan helps prevent mistakes...reduces chances of applying wrong lubricant.

For years, department foremen of a large folding box plant purchased "special" lubricants to meet individual needs. Throughout the plant, a total of twelve products were being used...some extremely high in price.

The man from Sun called management's attention to this fact. He pointed out that much of the plant equipment, although different in name and function, was mechanically the same. He proved that over 70% of the equipment could be lubricated by two products instead of several lubricants basically alike.

Today, as a result of Sun's recommendations, "special" lubricants are gone; costs of lubrication are down 15%; and, oil inventories are reduced by 42%.

For the full story about how Sun can simplify lubrication setups and save on oil costs...see your Sun representative or write Sun Oil Company, Philadelphia 3, Pa., Dept. IA-8.



INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY

PHILADELPHIA 3, PA.

IN CANADA: SUN OIL COMPANY, LTD., TORONTO AND MONTREAL

0

Midget two high-four high rolling mill is introduced

Said to be the world's smallest, this two high-four high combination rolling mill is being made available. A definite market has already been claimed for the new unit in production plants and research laboratories. The mill features many of the refinements of its larger counterparts and may be used for hot or cold rolling of ingots, strip and wire shapes. It is equipped with a four in. diam x six in. face width backup rolls and ¾ in. diam work

rolls. In addition, it can employ work rolls of other diam. Rolls are driven by torque arms from a totally enclosed pinion stand with radial loads being taken by heavy duty roller and ball bearings controlling axial movement. Each backup roll bearing has a radial load capacity of 35,000 lb. This is equivalent to a maximum roll separating force of 70,000 lb. Machine requires only 10 sq ft of space. Stanat Mfg. Co.

For more data circle No. 34 on postcard, p. 97



Electronic recorder provides greater versatility

This new recorder can be used in place of, or in conjunction with, company's standard dial indicator. Maker says it provides unmatched testing versatility. It not only plots the load applied, but also the load vs. extension (stress-strain) or load vs. time. In operation on the firm's 12,000 lb universal testing machine, the recorder plots any one of 12 testing ranges from 1.2 to 12,000 lb with complete accuracy, according to the manufacturer. The

operator merely has to flip a switch on the control panel to set the range. The recorder then automatically adjusts to the preset conditions of the test. The variable speed, electronic drive that powers this screw type testing machine provides positive loading speeds at all times, the maker says. Crosshead speeds can be varied in a range from 0.0500 to 20 ipm. Tinius Olsen Testing Co.

For more data circle No. 35 on postcard, p. 97



Trim, slit sheet automatically at high speed

New, automatic equipment can trim and slit 30 to 70 sheets a minute on high speed can lines. The two-unit machine can (1) trim and square tinplate, or (2) trim and slit sheets into blanks for the bodymaker. Bearing housing, bearings and sleeves lift off as a unit, without dismantling the rest of the slitter. Operators sharpen cutters in place. Both features reduce machine downtime. Twin-drive units mount on a common base, and are powered dually by a geared-head motor. E. W. Bliss Co.

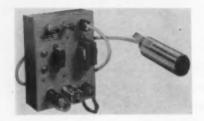
For more data circle No. 36 on postcard, p. 97



Press form or cut in same automatic machine

Automatic, high - speed machines perform either press forming or metal removing jobs at once on both ends of rod or tubular stock up to 24 ft long and 6 in. diam. Production rates range from 300 to 5000 pieces per hour. Without twin motorized heads turning, machine operates like a forming press to expand, reduce, flare or bead parts. With heads turning, it can burr, face, spin, drill, precision bore or ream both ends. W. P. Hill, Inc.

For more data circle No. 37 on postcard, p. 97



Limit switch makes no physical contact

Known as a "proximity" limit switch, this device converts mechanical position or motion into an electrical signal without physical contact between the part and the switch. The part must be of ferrous (magnetic material. Available with either relay output or tube output (the latter eliminates all moving parts), switch may be used in existing standard 110v control circuits. Relay panel has 5 amp output. Square D Co.

For more data circle No. 38 on postcard, p. 97

Ship fast

FASTER ON THE GROUND—United uses special equipment to handle your shipment swiftly, deftly!

FASTER IN THE AIR—United's "Big Lift" DC-6As with weather-mapping radar trim hours off coast-to-coast air time!

Ship sure

YOUR SHIPMENT can be preloaded on recessed-wheel aluminum pallets for protection and speed in handling!

MOTORIZED TUG BAR on "Big Lift" Cargoliners moves your heaviest shipments with care and precision!

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RESERVED AIR FREIGHT guarantees you space dependability on all Cargoliners—and Mainliners!

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DENVER to OMAHA	9			0			\$6.42
NEW YORK to CHICAGO .				*	*		\$7.50
SEATTLE to LOS ANGELES		9	0	9	0	0	\$12.02
PHILADELPHIA to PORTLANI	D						\$24.15
SAN FRANCISCO to BOSTO	N				0	0	\$27.00

*These are the rates for most commodities. They are often lower for larger shipments. Rates shown are for information only, are subject to change, and do not include the 3% federal tax on domestic shipments.

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For service or information, call the nearest United Air Lines Representative. Write for free Air Freight booklet, Cargo Sales Division, Dept. IA-8, United Air Lines, 5959 S. Cicero Ave., Chicago 38.

Drilling, tapping done by flipping switch

Choice of production drilling or tapping by the mere flip of a switch is now possible with a new combination drill and tap unit. Instant changeover from drilling to tapping for long or short production runs is possible without adding a special tapping attachment. Both drill and tap insert directly into the standard $\frac{3}{8}$ in. capacity chuck. This direct tool approach, the manufacturer claims, results in

less tool overhang, closer mounting to the work fixture and the use of the same fixture to drill and tap for lower tooling costs. Changing the direction of tool rotation for tapping is done electrically. No clutches are used. With the control set for tapping, the direction of rotation automatically reverses at bottom of stroke to withdraw tap. The manufacturer states the tap will produce better, cleaner

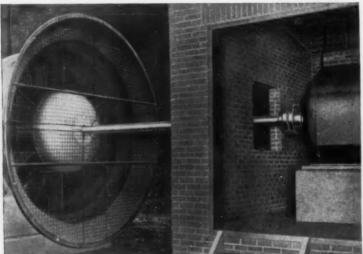
threads because of the two-way pneumatic system which makes it possible to infinitely adjust both the forward and retract air pressures.



to prevent tearing of top threads when pulling tap out of workpiece. Optional hydraulic feed control and electronic cycling for deep hole drilling are available. The Dumore Co.

For more data circle No. 39 on postcard, p. 37

Eliminate Intermediate Bearings!



By using Thomas Flexible Couplings on long, unsupported shafts, intermediate bearings are eliminated. Thomas engineers tubular shafts free from lateral whip.

The large fan shown above is 16' from the motor to allow sufficient air intake. Miners working underground receive their fresh air supply from this fan and others like it,

which have been giving dependable service for as long as fifteen years... without shutdowns for lubrication or maintenance of the couplings. Thomas floating shaft flexible couplings are recommended for machine and marine drives, printing presses, paper and cement mills, cooling towers, diesel engines, pumps, com-

Only Thomas Flexible Couplings offer all these advantages UNDER LOAD and MISALIGNMENT

- Freedom from Backlash— Torsional Rigidity
- 2. Free End Float
- 3. Smooth Continuous Drive with

Constant Rotational Velocity

- 4. Visual Inspection in Operation
- 5. Original Balance for Life

pressors, and many other uses.

THOMAS ALL METAL COUPLINGS HAVE NO WEARING PARTS SO LUBRICATION AND MAINTENANCE ARE ELIMINATED

Write for Engineering Catalog 51A

THOMAS FLEXIBLE COUPLING COMPANY

WARREN, PENNSYLVANIA, U.S.A.

New 15 ton press

Well-known manufacturers of air hydraulic presses, index tables, hammers and related equipment have just announced they are in production on a big, new, low cost air hydraulic press with a rated capacity of 15 ton, increasing to 21 ton with line pressure of 100 lb. Company officials state the model



has a force in far greater proportion to its size (15 in. wide, 26% in. deep, 40 in. high on 34 in. stand) than any other make. There are no intricate mechanisms, and few parts to wear out or foul up. Air-Hydraulics, Inc.

For more data circle No. 40 on postcard, p. 97

Several groups of electronic instruments are unveiled

This precision field meter for measuring absolute or differential fields without regard to the Earth's field is among several new groups of electronic test instruments to be made available. Due for introduction at the Instrument-Automation Exhibit next month, the line also includes a redesigned ultrasonic thickness measurement instrument weighing only 30 lb. Other units include: eddy current instruments

for detecting seams and other discontinuities in non-magnetic tube and rod products, an automatic frequency measure for determining the modulus of elasticity and damping characteristics of materials. In addition there will also be a series of instruments for sorting magnetic parts for hardness, depth of case, defects, etc. Magnaflux Corp.

For more data circle No. 41 on postcard, p. 97



Carriage return

A new safety device for the automatic return of the motor carriage and cutting member of its radial arm woodworking machines has been introduced. This spring-actuated unit is said to greatly increase operator protection from moving parts by immediately re-



turning the cutting mechanism to rear idle position the instant he relaxes his forward pull on the carriage. It is a self-contained unit, employing a special spring arrangement and cable-retrieving reel to permit a long cable payout without excessive force build-up. DeWalt, Inc., subsidiary of American Machine & Foundry Co.

For more data circle No. 42 on postcard, p. 97

Shop surface grinder

Originally engineered for the automotive service field, a new wet surface grinder has features that can make it attractive for many jobs in production and in the tool shop. If holds tolerances down to 0.0002 in. Grinding wheel is 16 in. dia., and takes work up to 42 x 72 in. Tillis Mfg. Co.

For more data circle No. 43 on postcard, p. 97



ERIE Bolts • Studs • Cap Screws • Nuts In Alloys • Stainless • Carbon • Bronze

Only the hands of the specialist can produce fasteners which will meet your design and engineering specifications with precise accuracy. Erie has been doing just that for more than 40 years . . . producing to customer specifications bolts, studs, cap screws and nuts for use in extreme temperature, corrosion and tensile applications for a wide diversity of industries. Submit your specifications to us with confidence.



ERIE BOLT & NUT CO.

Erie, Pennsylvania

Representatives in Principal Cities





To gas weld steel

SOLUTION:

Airco #1 Alloy Steel Rod. Designed for welding low carbon and low alloy steels. Provides high ductibility in "as welded" condition when welding with a neutral flame or with a slight excess of acetylene. It is smooth flowing, insuring good control of molten pool. Recommended for all general pipe and plate welding, aircraft structures and maintenance work.

Airco #4 High Tensile Welding Rod. Whenever current codes and product specifications allow the use of a lower priced, high strength rod, Airco #4 will meet all specifications. This rod is for producing welds in low alloy steel requiring minimum tensile requirements of 62,000 psi.

Airco #7 Mild Steel Rod. This low priced general purpose welding rod is popular in job shop and maintenance work for welding low carbon steel. In using this rod it is suggested that the weld metal pool be worked so as to include a fair amount of base metal in the mixture.

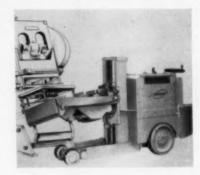
Send for this free catalog!

You'll find here the finest rods and fluxes for joining both ferrous and non-ferrous metals. Write Airco at address below.



Truck removes or sets dies onto inclined presses

Designed for handling dies onto medium to large size inclined presses, a new die handling truck has been developed. Removing or setting dies in inclined presses, maker says, often presents the problem of tipping the die to bring it into alignment with the press bed. This is complicated by dies too heavy for manual handling. They must be handled gently to avoid damage to press or die. This truck permits changing dies more rapidly, thus reducing down time. It has a 5000 lb capacity. It is said to almost entirely eliminate damage. It is built on an electric powered high lift platform truck chassis equipped with a rotating,



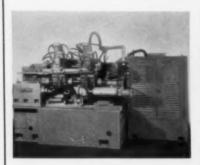
tilting platform 44 in. wide x 50 in. high. Elwell-Parker Electric Co.
For more data circle No. 44 on postcard, p. 97

Automatic production lathe models make their bow

Two models of a new automatic production lathe are now available. They come in several sizes and combinations of mechanical feeding or hydraulic tracer slides. Both can be tooled in a wide variety of arrangements for short run or high production turning, with or without automation. One machine has an 18 in. swing over the carrage

over the carrage ways is 24 in. and 16 in. over the cross slide ways. Maximum in-put is 60 hp. Both models can be arranged for chucking or between center work. Reed-Prentice Corp.

For more data circle No. 45 on postcard, p. 97



ways and 12 in. over the cross slide ways. Its maximum in-put is 30 hp. The other model's swing

Double-end lathes

Special double-end, hollow-spindle lathes profile bore and face intricate workpieces in one setting. Heavy duty machine carries a 32-in. spindle on a one-piece, 38-ft. long bed with a carriage on both ends of headstock. Spring-loaded rollers support carriage weight. Lehman-Brandes Machine Co.

For more data circle No. 46 on postcard, p. 97



PROMPT WAREHOUSE SERVICE ONLY

Most Complete Stock in America of

BLUE TEMPERED SPRING STEEL

We believe that the way to sell is to carry a stock which permits satisfying any reasonable warehouse demand.

878 Rindge Ave. Ext. Phone UN 4-2460 CAMBRIDGE 40, MASS.

Branch

3042-3058 W. 51st Street, CHICAGO, ILL Phone: Grovehill 6-2600

Hot steel cutter keeps operators cool

Operators keep cool in cutting hot steel rod with a new model hydraulic tool. Its 3-ft extension permits remaining at a safe distance while cutting heavy coiled rod as it comes from the furnace at 1000°F temperatures and higher. Weighing 120 lb, the machine delivers 65 tons cutting thrust. The unit normally suspends from a spring tension balancer. Capacity is 11/4 in. on medium to high carbon steel rod. Operator controls cutting action by a hand valve at handle. Cutting requires only 2 seconds. Blade and anvil of cutting head interchange and wear



points reverse to increase blade life. Manco Mfg. Co.

For more data circle No. 47 on postcard, p. 97

Mist coolant collector captures fog, smog, mist

Machine shops employing mist-type coolant may like a new, compact collector just announced. Available in several capacities, it's intended to capture fog, smog and mist from surface, cylindrical and thread grinders, lathes, screw machines, and other machine tools using cutting oils. Machine requires a minimum of floor space, and can

even suspend from the ceiling if desired. Filter needs replacing only when suction is lost at the hood or vapor discharges through the filter. Advantages claimed include:



cleaner air for workers, cleaner plant, reduction of painting and maintenance costs, and reduction of fire hazard. Hammond Machinery Builders, Inc.

For more data circle No. 48 on postcard, p. 97

Automatic torquing tool

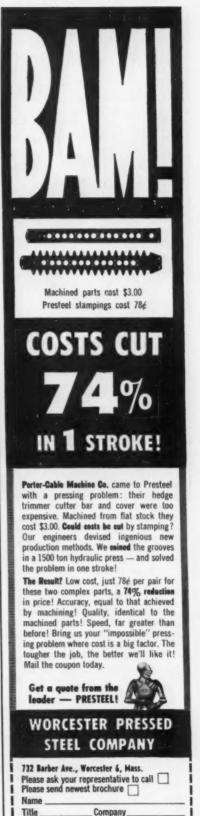
An electric impact tool recently announced reportedly eliminates need for checking torque with a calibrated hand torque wrench. Automatic torque control makes this possible. The tool runs down fastenings at 1900 impacts per minute. Ingersoll-Rand Co.

For more data circle No. 49 on postcard, p. 97

Street

City

Zone





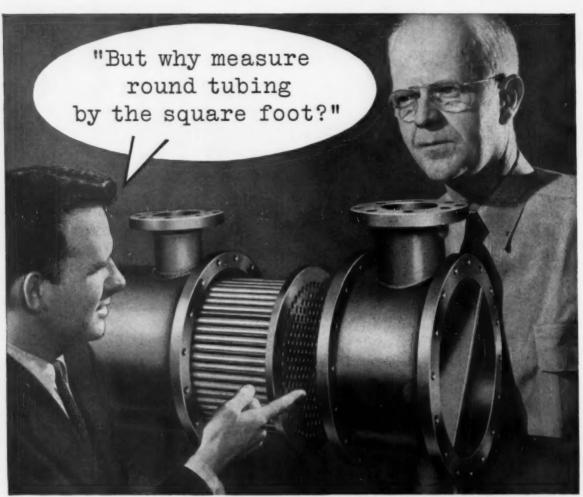


Photo courtesy Ross Heat Exchanger Division of American-Standard, Buffalo, N.Y.

"Because Ross Heat Exchanger Division has to be able to tell its customers how much cooling surface they're getting, That's a vital factor in a heat exchanger."

"I get it. That's why they use so many small tubes, instead of a few large ones. And Superior supplies the tubing?"

"Right. Stainless is the most popular, in % in. or % in. OD. But they order other analyses, too. The tubing has to have thin walls to perform the heat exchange function efficiently. It has to be strong to withstand the system pressure. And it's got to have smooth, clean inner and outer surfaces to minimize any pressure drop. Finally, it has to be tough, yet ductile enough to make installation easy."

Lend an ear, Mr. Design Engineer. They're talking

about Superior tubing. The unit under discussion is made by Ross Heat Exchanger Division of American-Standard, one of the leading heat exchanger manufacturers. Superior tubing gives them the quality and dependability they like to build into their products.

This is only one of the many applications of Superior tubing in industry. We offer a wide range of tubing sizes in over 63 analyses, including stainless, carbon and alloy steels, nickel and nickel alloys, beryllium copper, titanium and zirconium.

Let us help you with *your* tubing problems. Our years of experience and our extensive facilities are at your service. For more technical information, write Superior Tube Company, 2004 Germantown Ave., Norristown, Pa., for your free copy of Bulletin No. 40.

Superior Tube

The big name in small tubing NORRISTOWN, PA.

All analyses available in .010 in. to % in. OD-certain analyses in light walls up to 21/2 in. OD

West Coast: Pacific Tube Company, 5710 Smithway St., Los Angeles 22, Calif. • RAymond 3-1331



The Iron Age SUMMARY...

Tough times ahead for steel consumers . . . Scramble for steel resembles free-for-all with no holds barred . . . Strike loss of 11-12 million ingot tons pinching hard.

No Holds Barred . . . Steel producers and consumers face a long, painful climb back to where they were before the strike. As the mills straggled back into production this week, the scramble for steel resembled a free-for-all with no holds barred.

A post-strike IRON AGE survey shows that metalworking plants squeezed through the strike itself in fair shape. But the worst is yet to come. With inventories depleted and future deliveries uncertain, many consumers were confronted with the prospect of cutbacks.

The strike cost 11-12 million ingot tons of production. And the mills are still far from being out of the woods. It will take at least three weeks before production is back to prestrike levels. And furnace roof cave-ins and deferred maintenance will plague the industry for months.

Construction and freight car building—heavy consumers of plates and structurals—were the hardest hit. Scores of important highway and building projects have been delayed. More will suffer the same fate before steel can be delivered. Freight car construction in some plants will be cut to near-zero unless emergency shipments can be made.

Automotive Comeback... To make matters worse, another major consumer—automotive—is coming to life. An expected sales pickup with introduction of new models is bringing the car makers into the steel market with both feet. Unexpected holes are showing up in Detroit inventories, forcing some divisions of the major producers to borrow steel from sister plants. Auto parts makers also will be in trouble before steel pipelines are running full again.

Strike losses posed a problem also for the fast-stepping oil and gas industry. Small independent drillers were in worst shape. But some of the large companies are holding off on drilling starts in some fields until the supply outlook becomes more certain.

False Security... The relative abundance of some steel products, notably sheets, could lead to a false sense of security. The tightness of plate, structurals, oil country goods, linepipe, reinforcing rod, and some bar sizes means that these products will be competing with flat-rolled for a share of available ingots. So flat-rolled output will suffer compared with pre-strike production.

Meanwhile, steel users are poised to raise their own prices in line with average \$8.50 increases set by the mills. There will be few exceptions.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week	Last Week 418	Month Ago 369	Year Ago 2,148
(iter ions, ooo omirred)	1,317	410	307	2,170
Ingot Index				
(1947-1949=100)	82.0	26.0	23.7	133.5
Operating Rates				
Chicago	40.0	6.0	6.0	95.0
Pittsburgh	60.0	8.0	6.0	95.0
Philadelphia	60.0	0.0	0.0	94.0
Valley	60.0	13.0	13.0	92.0
West	40.0	24.0	26.0	96.0
Detroit	43.0	51.0	25.0	90.0
Buffalo	63.5	0.0	0.0	100.0
Cleveland	62.0	0.0	0.0	79.0
Birmingham	11.0	3.5	3.5	23.0
S. Ohio River	68.0	73.0*	63.0	92.0
Wheeling	71.0	55.0	58.0	98.0
St. Louis	96.0	103.0	95.0	98.0
Northeast	55.0	47.0	47.0	85.0
Aggregate	53.5	17.0	15.5	89.0

Prices At A Glance

cents per lb unless otherwis	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.619	5.179	5.179	5.174
Pig Iron (Gross Ton)	\$62.95	\$61.36	\$60.61	\$59.09
Scrap, No. 1 hvy				
(gross ton)	\$55.50	\$52.67	\$44.83	\$44.00
Nonferrous				
Aluminum ingot	25.90	25.90	25.90	23.20
Copper, electrolytic	46.00	46.00	46.00	36.00
Lead, St. Louis	15.80	15.80	15.80	14.80
Magnesium	34.50	34.50	34.50	29.25
Nickel, electrolytic	64.50	64.50	64.50	67.67
Tin, Straits, N. Y.	100.25	100.25	96.25	97.50
Zinc, E. St. Louis	13.50	13.50	13.50	12.50
* Reflects U. S. Steel increas	es.			

*Revised

Steel Prices Up \$8.50 Per Ton

U. S. Steel increases effective Aug. 7... Other producers expected to follow suit... Increase of 6.25 pct compares with employment cost rise of approximately 7.6 pct.

◆ FOLLOWING are new mill prices of U. S. Steel, effective at 12.01 a.m. Aug. 7. Prices are in dollars per net ton unless otherwise noted. Extras apply. Former prices are listed for comparison.

	New Price	Old Price	In- crease
CARBON STEEL:			
Ingots, forging	\$ 70.50	\$ 65.50	\$ 5.00
forging	91.50	84.50	7.00
rerolling	74.00	68.50	5.50
Skelp	92.50	84.50	8.00
Tube rounds	111.50	103.50	8.00
shapes	101.50	93.00	8.50
Fairless Works	104.50	96.00	8.50
Special quality bars	108.50	100.00	8.50
Fairless Works	111.50	103.00	8.50
Cold-finished bars	137.00	125.00	12.00
Concrete rein. bars	101.50	93.00	8.50
Fairless Works	104.50	96.00	8.50
Structural shapes CB's (including CBL,	100.00	92.00	8.00
CJB and CB sections) Bearing piles (CBP	100.00	92.00	8.00
sections)	100.00	92.00	8.00
Sheet piling	118.00	109.00	9.00
Plates	97.00	90.00	7.00
Floor plates	118.50	111.50	7.00
Standard T. Rails			
No. 1 O.H.	101.50	94.50	7.00
Light rails	120.00	113.00	7.00
Tie plates	120.50	112.50	8.00
Joint bars for standard			
rails	127.00	116.50	10.50
Track spikes	175.50	161.00	14.50
Axles	162.00	150.00	12.00
Hot-rolled strip	93.50	86.50	7.00
Hot-rolled sheets			
(18 ga and heavier)	93.50	86.50	
Fairless Works		87.50	7.00
Cold-rolled sheets		106.50	
Fairless Works Galvanized sheets.	116.00	107.50	8.50
regular	126.50	117.00	9.00
Vitrenamel sheets	126.50	118.00	8.50
HIGH STRENGTH PRO	DUCTS		

HIGH STRENGTH PROP USS COR-TEN	DUCTS:		
Structural shapes	147.00	135.00	12.00
CB sections	147.00	135.00	12.00
Plates	145.00	134.50	10.50
HR bars, small shapes.	148.50	136.00	12.50
Hot-rolled sheets	138.00	127.50	10.50
Fairless Works	139.00	128.50	10.50
Galvanized sheets	185.50	172.00	13.50
Cold-rolled sheets	170.50	157.50	13.00
Fairless Works	171.50	158.50	13.00
Hot-rolled strip	139.00	128.50	10.50
LICC MAN TEN			

Fairless Works	139.00	128.50	10.5
Galvanized sheets	185.50	172.00	13.5
Cold-rolled sheets	170.50	157.50	13.0
Fairless Works	171.50	158.50	13.0
Hot-rolled strip	139.00	128.50	10.5
USS MAN-TEN			
Structural shapes	120.00	112.00	8.0
CB sections	120.00	112.00	8.0
Plates	118.00	111.00	7.0
HR bars, small shapes.	117.50	109.00	8.5
HK bars, small shapes.	117.50	109.00	8.

	New Price	Old Price	In- crease
Hot-rolled sheets	110.50	103.50	7.00
Fairless Works	111.50	104.50	7.00
Hot-rolled strip	110.50	103.50	7.00
USS ABRASION RESISTI	NG		
Plates	120.00	113.00	7.00
HR bars, small shapes.	124.50	116.00	8.50
Hot-rolled sheets	116.50	109.50	7.00
Hot-rolled strip	116.50	109.50	7.00
USS MAN-TEN S			
Structurals	129.00	121.00	8.00
CB sections	129.00	121.00	8.00
Plates	127.00	120.00	7.00
Bars and small shapes.	126.50	118.00	8.50
Hot-rolled sheets	119.50	112.50	7.00
Fairless Works	120.50	113.50	7.00
Hot-rolled strip	119.50	112.50	7.00
WIRE PRODUCTS Wire rods carbon Donora, Cleveland, Joliet and Fairfield Worcester Cold-rolled low carbon strip	116.00 122.00	107.50 113.50	8.50 8.50
Cleveland	137.00	125.00	12.00
New Haven	146.00	134.00	12.00
Worcester	148.00	136.00	12.00
Rankin, Waukegan	144.00	100.00	****
and Fairfield		132.00	
Worcester	150.00	138.00	12.00
Cleveland, Donora, Duluth and Waukegan	168.00	152.00	16.00
New Haven, Trenton	100.00	136.00	10.00
and Worcester	174.00	158.00	16.00
MB spring wire—high carbon			
Cleveland, Donora, Duluth and Waukegan	104 50	150.00	16.50

Purchasing Agent's Checklist

SPECIAL REPORT: Survey of weak and strong points in steel market outlook now that strike's over p. 35
MARKETING: Conveyor I n d u s t r y enters new marketsp. 39
MANUFACTURING: Stainless 201 finds new automotive use p. 43
BUSINESS: Aluminum's top man tells what's in store for independent fabricators

	New Price	Old Price	În- crease
Trenton and Worcester Wire—merchant quality annealed	180.50	164.00	16.50
Cleveland	162.00	150.00	12.00
Rankin and Fairfield Worcester	162.00 168.00	150.00 156.00	12.00
Wire—merchant quality galvanized	100.00	130.00	12.00
Donora, Duluth, Joliet, Rankin and Fairfield	170.00	158.00	12.00
Worcester Nails Donora, Duluth, Joliet,	176.00	164.00	12.00
Rankin and Fairfield.	167.00	152.00	15.00
Worcester Wire—barbed Donora, Duluth, Joliet,	173.00	158.00	15.00
Rankin and Fairfield Woven-fence	187.00	175.00	12.00
Donora, Duluth, Joliet, Rankin and Fairfield. Bale-ties	181.00	162.00	19.00
Donora, Duluth, Joliet and Fairfield Polished staples	195.00	175.00	20.00
Donora, Duluth, Joliet, Rankin and Fairfield.	167.00	152.00	15.00
Worcester	173.00	158.00	
ALLOY STEEL:			
Ingots (net ton) Billets, blooms, slabs	74.00 107.00	69.00 96.00	5.00
Hot-rolled bars	122.50	111.50	11.00
Fairless Works Cold-rolled bars	125.50	114.50	11.00
Plates	137.00	126.00	11.00
shapes	124.00	113.00	11.00
sheet	155.00	144.00	11.00
OTHER ITEMS:			
Electrical sheets	220.00	199.00	21.00
Cut lengths, 22 ga Long ternes	134.00	125.00	9.00
PIPE AND TUBULAR P	-		
Buttweld standard and line pipe, black and	Increase		
	\$12.00 N	i.T.	
Seamless standard and line pipe, black and galvanized 2"—4"	#12.00 h		
2"—4"	\$12.00 N		
line pipe	\$11.50 N	i.T.	
Electric weld line pipe 26"—36"	\$ 9.50 N	i.T.	
Oil country casing Grade J55, Short T and C (all sizes)	\$13.75 N	i.T.	
Oil country tubing Grade J55, Upset T and C (all sizes)	\$14.25 N	N.T.	
Drill pipe Grade D (Internal upset) all sizes	\$22.25 N	N.T.	
Seamless pressure and mechanical tubing Carbon	Increase	d appro	ri-

Stainless steels
Mill prices, bases and extras, are increased 6.25 pct.

Comparison of Prices

(Effective Aug. 7, 1956)

Steel prices on this page are the major producing areas: Pit	e average	of variou	Gary, Cl	otations eveland.		Aug. 7 1956	July 31 1956	July 10 1956	Aug. 9 1955
toungstown.					Pig Iron: (per gross ton)				
Price advances over previous	week are	printed	in Heavy	Type;	Foundry, del'd Phila	\$66.51	\$66.51	\$65.26	\$63.69
leclines appear in Italics.					Foundry, Valley	63.00	60.50	60.50	59.00
	Aug. 7	July 31	July 10	Aug. 9	Foundry, Southern Cin'ti	62.93	62.93	62.93	62.93
	1956	1956	1956	1955	Foundry, Birmingham	57.67	57.67	57.67	55.38
Flat-Rolled Steel: (per pound)				2000	Foundry, Chicago	63.00	68.00	60.50	59.00
Hot-rolled sheets	4.51e	4.325€	4.325¢	4.325¢	Basic del'd Philadelphia	65.73	65.73	64.48	62.77
Cold-rolled sheets	5.431	5.325	5.325				60.00	60.00	58.50
Galvanized sheets (10 ga.)				5.325	Basic, Valley furnace	62.50		60.50	59.00
Hot welled string	5.85	5.85	5.85	5.85	Malleable, Chicago	63.00	63.00	60.50	59.00
Hot-rolled strip	4.469	4.325	4.325	4.325	Malleable, Valley	63.00	60.50		
Cold-rolled strip	6.34	6.28	6.28	6.29	Ferromanganese, cents per lb.1	10.75¢	10.75∉	9.50¢	9.50
Plate	4.61	4.52	4.52	4.52	74 to 76 pct Mn base.				
Plates, wrought iron	10.40	10.40	10.40	9.80					
Stainl's C-R strip (No. 802)	44.50	44.50	44.50	44.50					
		44.00	44.00	44.00	Pig Iron Composite: (per gross to		001.00	\$60.61	359.09
fin and Terneplate: (per base box					Pig iron	\$62.95	\$61.36	400.01	400.00
Tinplate (1.50 lb.) cokes	\$9.85	\$9.85	89.85	29.0E					
Tinplates, electro (0.50 lb.)	8.85	8.55	8.55	7.75	Comme (non owner ton)				
Special coated mfg. ternes	9.10	9.10	9.10	7.85	Scrap: (per gross ton)		\$55.00	\$44.50	\$45.00
				1.00		\$56.50			45.50
Bars and Shapes: (per pound)					No. 1 steel, Phila. area		52.00	46.50	
Merchant bars	4 007 -	4.054	4 000	4.054	No. 1 steel, Chicago	55.50	50.50	43.50	41.50
Cold Soisbad bars	4.825e	4.65e	4.65¢	4.65¢	No. 1 bundles, Detroit	51.50	51.50	39.50	38.50
Cold finished bars	5.90	5.90	5.90	5.90	Low phos., Youngstown	61.50	57.50	50.00	46.50
Alloy bars	5.65	5.65	5.65	5.65	No. 1 mach'y east, Pittsburgh.	59.50	55.50	54.50	44.50
Structural shapes	4.87	4.60	4.60	4.60	No. 1 mach'y cast, Philadel'a	57.50	55.50	54.50	43.50
Stainless bars (No. 802)	38.25	38.25	38.25	88.25		59.50	54.50	47.50	52.50
Wrought iron bars	11.50	11.50	11.50	10.40	No. 1 mach'y cast, Chicago	33.34	04.00	41.00	02100
Wire: (per pound)					Steel Scrap Composite: (per gros	s ton)			
Bright wire	6.60€	6.60∉	6.60∉	6.25#	No. 1 heavy melting scrap		\$52.67	\$44.88	\$44.00
Rails: (per 100 lb.)					C-b- C	at aven	1		
Heavy rails	\$4.90	84.725	\$4,725	\$4,725	Coke, Connellsville: (per net ton		\$14.50	\$14.50	\$13.25
Light rails	6.65	5.65	5.65	5.65	Furnace coke, prompt Foundry coke, prompt		17.50	17.50	16.25
Semifinish Steel: (per net ton)					- and some prompt to the				
Rerolling billets	268 50	*#0 EO	940 50	840 50	Nonferrous Metals: (cents per po	annd to	large buyer	ra)	
Olaha manilling	00.00	\$68.50	\$68.50	\$68.50			40.00*	46.00	36.00
Slabs, rerolling		68.50	68.50	68.50	Copper, electrolytic, Conn		40.00*	46.00	36.00
Forging billets	84.50	84.50	84.50	84.50	Copper, Lake, Conn				97.00
Alloy blooms, billets, slabs	96.00	96.00	96.00	96.00	Tin, Straits, New York		100.25	96.25	
					Zinc, East St. Louis		13.50	13.50	12.50
Wire Red and Skelp: (per pound	1)				Lead. St. Louis	15.80	15.80	15.80	14.80
Wire rods	5.025∉	5.0254	5.0254	5.0254	Aluminum, virgin ingot		25.90	25.90	23.20
Skelp	4.225	4.225	4.225	4.225	Nickel, electrolytic		64.50	64.50	67.67
	4.440	4.220	4.220	4.220	Magnesium, ingot		34.50	34.50	29.25
Finished Steel Composite: (per r	hound)				Antimony, Laredo, Tex		88.00	38.00	28.50
	5.619e**	5.179é	5.179€	5.174é	† Tentative. ‡ Average. * Revised	1. ** Re			reases.
Base price									

Dollars per grass ten, f.a.b., subject to switching charges.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Phila-delphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Phila-delphia and Chicago.

PIG IRON

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

STAINLESS STEEL

Base price cents per fb. f.s.b. mill.

201	Preduct	Low Phos.	Bess.	Mall.	Fdry.	Basic	Producing Point
18.50	Ingets, rerell.		63.50	63.00	62.50	62.00	Bethlehem B3
			66.00	65.50	65.00	64.50	Birdaboro, Pa. B6
23.00	Slabs, billets, rerell.				55.00°	54.50	Birmingham R3
		**** * * *		63.88	59.88*	58.50	Birmingham W9
-	Forg. des., die blks., rgs.		41.50	63.00	59.00*	58.50	Birmingham U4
		******	61.50	61.00	60.50	60.00	Buffalo R3
-	Billets, forging		00.00	61.00	69.50	60.00	Buffalo H1
	_	******	66.00	65.50	65.00	64.50	Buffalo W6
-	Barr, struct.		63.50	63.00	62.50 63.00	62.00 62.50	Chester C/7
	ma .	65.801	61.00	68.50	66.50	60.00	Chicago 14
-	Piates		61.00	60.50	60.50	60.00	Claveland R3
40.00		*******			55,00		Dallas
42.25	Sheets	67.50:	63.50	63.00	63.00	62.50	Dulpth /4
91 00	Stale hat called	67.501	63.50	63.00	63.00	62.50	Erio 14
31.00	Strip, het-refled	41.00	93.30	64.25	63.75		Everett M6
39.00	Strip, cald-relied				70.50	70.00	Fentane K1
39.00	Strip, cata-retted			******	60.50	60.00	Gapava, Utah C7.
	Wire CF, HR: Red HR		******	65,40	64.90	64.40	Granite City G2.
-	wire Cr, ISK; Red IIK			60.50	01.50	01.10	Hubbard Y/
1		******	******	00.00	******	60.00	Midland Cl1
				63.00	62.50	62.00	Minnegua C6
opuc	STAINLESS STEEL PR					60.00	Manassan P6
		67.591	63.50	63.00	63.00	62.50	Navilla Is. P4
	Sheets: Midland, Pa., C		64.00	63.50	63.00		N. Tonawanda TI
	lower on Type 430), J2; Bo		61.00	60.50		60.00	Pittsburgh UI
hilade	lad., 12; Ft. Wayne, 14; 1		63.50	63.00	63.00	62.50	Sharpaville S3
: Wau	Strip: Midland, Pa., Cl.			60.50		60.00	Sa. Chicago R3
	ington, Pa., W2; W. Leech	68.00	63.50	63.00	62.50	62.00	Steelton B3
Pa. S	Youngstown, C5; Sharon,		65.50	65.50	65.00	64.50	Swadeland A2
Gary.	New Bedford, Mass., R6;		63.50	63.00	63.00	62.50	Tolodo 14
_		68.00	63.50	63.00	62.50	62.00	Trey, N. Y. R3
Duque	Bar: Baltimore, A7; S.		61.00	60.50			Toungstown Y1

DIFFERENTIALS: Add, 50¢ per ten for each 0.25 pct allicen or pertien thereof over base (1.75 to 2.25 pct except law place, 1.75 to 2.00 pct) 50¢ per ten for each 0.50 pct law place, 1.75 to 2.00 pct) 50¢ per ten for each 0.50 pct 0.5 to 0.75 pct nickel, 51 for each additional, 0.25 pct nickel, 52 for each additional, 0.25 pct nickel, 52 for each additional, 0.25 pct nickel, 51 for each additional, 0.25 pct nickel 9.50 pct 1.00 pct 0.50 pct 1.00 pct 0.50 pct

Product	201	202	301	392	383	204	318	321	345	410	416	439
Ingets, rerell.	18.50	19.75	19.25	29.50	-	21.78	23.00	26.00	35.25	15.00	-	15.25
Slabs, billets, rerell.	23.00	25.50	23.75	26.25	26.75	27.50	41.75	33.50	44.50	19.50	-	19.75
Forg. des., die blks., rgs.	-	-	-	-	-	-	-	-	-	-	-	-
Billets, forging	-	31.00	31.75	32.89	34.75	33.75	\$2.75	39.75	\$2.58	25.50	26.98	26.00
Barr, struct.	-	36.75	38.00	18.25	41.00	49.23	62.75	47.23	62.00	30.50	31.00	31.00
Piates	-	38.75	49.00	48.25	G.75	43.00	88.88	\$1.25	66.75	31.75	33.80	32.21
Sheets	42.25	42.50	44.25	44.58	82.25	67.25	79.25	86.25	75.50	36.25	-	36.78
Strip, but-rolled	31.00	33.50	32.00	34.50	-	37.26	89.75	45.75	61.25	28.00	-	28.75
Strip, cald-relied	39.00	42.50	41.00	44.50	-	47.23	79.25	86.25	75.50	36.25	-	36.79
Wire CF, HR; Red HR	-	-	36.00	34.25	39.88	38.25	19.78	45.00	59.88	29.00	29.50	29.58

STAINLESS STEEL PRODUCING POINTS:

Shetis: Midland, Pa., CII; Brackenridge, Pa., 43; Butler, Pa., 41; Vandergriit, Pa., UI; Washington, Pa., W2 (2.234 lower on Type 430), J2; Baltimore, EI; Middletown, O., 47) Massillon, O., 83; Gary, UI; Bridgeville, Pa., U2; New Castle, Ind., I2; Ft. Wayne, J4; Philadelphia, D3.

Strip: Midland, Pa., Cl.; Waukegan, Cleveland, A5; Carnegie, Pa., S9; McKossport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; W. Leechburg, Pa., A3; Bridgeville, Pa., U2; Detreit, M2; Canten-Massillon. O., R3; Harrison, N. J., D3; Youngstown, C5; Sharon, Pa., S1; Butler, Pa., A7; Wallingford, Coom., U3 (.25¢ per lb higher); W1 (.25¢ per lb higher); W1 (.25¢ per lb higher); W1 (.25¢ per lb higher); W2 (.25¢ per lb higher); W3 (.25¢ per lb higher); W3 (.25¢ per lb higher); W4 (.25¢ per lb

Bar: Baltimore, A7; S. Duquesne, Pa. U1; Munhall, Pa., U1; Randlag, Pa., C2; Titusville, Pa., U2; Washington, Pa., I2; McKeesport, Pa., U1, F1; Bridgeville, Pa., U2; Oustie, N. Y., A3; Masallian, O., B2; S. Chicago, U1; Syracuse, N. Y. C1; Waterville, N. Y., A5; Wastegan, A5; Castron, O., T3; Pt. Wayne, I4; Philadelphia, D3; Datrait, B3; Gary, U1.

Wire: Waukegan, A5) Massillon, O., R3; McKeespeet, Pa., F1; Ft. Wayne, J4; Harrison, N. J., D3; Baltimore, A7; Dunkirk, A3; Monessen, P1; Syracuse, C11; Bridgeville, U2. Structurals: Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervillet, N. Y., A3; Syracuse, C11; S. Chicago, UI.

Plates: Brackenridge, Pa., A3; Chicago, UI; Munhall, Pa., UI; Midland, Pa., CII; New Castle, Ind., I2; Middletswa, A7; Washington, Pa., J2; Cleveland, Massillon, R3; Castesville, Pa., C15; Philadelphia, D5; Vandergrift, Pa., UI; Gary.UI. Forged discs, die blochs, rings: Pittsburgh, CII; Syracuse, CII; Ferndale, Mich., A3; Washington, Pa., J2.

Forgings billets: Midland, Pa., C11; Baltimore, A2; Washington, Pa., 12; McKeesport, F1; Massillon, Canton, O., R3 Watervliet, A3; Pittaburgh, Chicago, U1; Syracuse, C11; Detreit, R5; Musball, Pa., S. Chicago, U1., ...

Prices Match All-Time High

Strike aftermath is likely to send composite even higher before week is out... After that, signs point to a leveling off period... Supply is increasing rapidly.

◆ PRICES MOVED up again in the first post-strike week sending THE IRON AGE composite up to \$55.50—equaling the all-time high set last April 17-24.

Prices probably will continue upward before leveling off. However, there are signs that the leveling may approach more swiftly than anticipated.

Start-up of openhearth furnaces in Pittsburgh caused a draining of scrap from other areas, especially Chicago and Cincinnati, which strengthened the market in those areas even though steelmaking was slower getting under way.

At Philadelphia and Boston, market strength was the result largely of two factors:

 Competition among domestic and export buyers for available scrap.

2) Mills are trying to get openhearth furnaces in operation without waiting for blast furnaces to get into production.

There are indications that the rebounding market may not bounce much higher. Some mills have released orders for shipment and dealer offerings have picked up. Even though most dealers haven't much inventory, there is an undercurrent of uneasiness.

Meanwhile, the scrap supply is growing as plant vacation periods terminate and collections start increasing.

Pittsburgh . . . Market here is a little steadier and still very strong Railroad specialties on an early list brought \$14 over last month's price. On the basis of broker buying and strength in railroad grades, openhearth prices are up \$1.50. Low phos punchings plate is up \$6 on foundry buying. Cast grades advanced \$4 and railroad grades are up as much as \$12. Despite these signs of strength, there is some feeling that

prices may be approaching a turning point.

Chicago . . . With heavy tonnages of material leaving the area, Chicago scrap prices continued to move up and dealers continued to hold what stocks they had in the yard. Mill offers to buy early Monday at \$56 for industrial heavy melting, \$57 for factory bundles, and \$58 for 2-ft low phos failed to hold the market. Scattered purchases confirmed substantially higher market prices, despite strong mill resistance to the current upsurge.

Philadelphia . . . Purchases by two mills in the area pushed steelmaking grades up \$2, to \$55 for No. 1 heavy melting. Premium grades were also up \$3-4, cast grades \$3-4 higher. Strength was the result of two factors: (1) export demand is heavy and price was up, forcing mills to match this price to get scrap needed because, (2) mills art trying to get openhearth furnaces in operation without waiting for blast furnaces.

New York . . . Brokers have raised buying prices on all grades in this area at least \$2 a ton to a top of \$50 for No. 1 heavy melting. Turnings also are up, and pipe foundries are paying \$2 a ton more for cast. Despite the activity, mills are reported in no hurry to release shipments held up by strike embargoes. Export business continues brisk here.

Detroit . . . Despite the lack of activity, the market has a strong undertone, even though it has lost some of the edge it had last week. No local buying has been reported, but one mill has started to pick up scrap which it stored during the strike. The general feeling is that if a buy is made this week the emphasis will be on secondary grades because of the high prices currently being quoted.

Cleveland . . . Valley market showed continued strength as some tonnage of premium priced electric furnace grades were bought at \$65 by three mills in the district and on fringes. This was \$7 over last price for same grades a few weeks ago, and high grade dealer material is being accepted. Remaining auto lists in Cleveland also went for about \$62, same as the first one last week. Continued strength in premium markets resulted in a \$2 increase in the Valley and sympathetically in Cleveland. Lack of orders from big openhearth mills since settlement of the strike is making brokers and dealers uneasy.

Birmingham . . . Steelmaking grades went up another \$2 this week to \$42-43, and some dealers are starting to let their stocks go at this price. The market picture at this time is confused by the status of a co-operative trucking arrangement for scrap dealers that is still in the formative stage. The nucleus of a corporation has been formed, with most Alabama dealers buying in a share of the stock. Under the arrangement, scrap will be hauled to a common terminal by truck, then transferred to railroad cars for shipment to mills.

St. Louis . . . Several railroad lists sold at advances from \$3-4 per ton, which affected most other items on the list. All items are in scarce supply and it is expected that when prices are set for August shipments later in the week, there will be further advances.

Cincinnati . . . One local and one fringe area mill made purchases within quoted limits. Dealer material is still scarce and collections are slow although end of plant vacations will bring on slight revival.

Buffalo... No sales were made in this area last week. Dealers yards still have low inventories since not much scrap was accumulated during the strike. Normal prices here are in sympathy with prices in the Valley. No. 1 heavy melting is up to \$50-51.

Boston . . . With both export and domestic buyers competing for available supply, the market approached a state of near-chaos. The entire list moved up, including an increase of \$6.50 per ton in the top openhearth grade.

West Coast...Low inventories and high export activity gave added strength to the market as mills closed down by the strike resumed operations.



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Pittsburgh

No. 1 hvy. melting	56.00	to	\$57.00
No. 2 hvy. melting	49.00	to	90.00
No. 1 bundles	56.00		
No. 2 bundles	45.00	to	46.00
Machine shop turn.	36.00	to	37.00
Mixed borfl and ms. turn	36.00	to	37.00
Shoveling turnings	40,00	to	41.00
Cast iron' borings	40.00	to	41.00
Low phos. punch'gs plate	67.00	to	68,00
Heavy turnings	50.00		
No. 1 RR. hvy. melting	64.00	to	65,00
Scrap rails, random lgth	69.00	to	70.00
Rails 2 ft and under	74.00	to	75.00
RR. steel wheels	73.00	to	74.00
RR. spring steel	73.00		
RR, couplers and knuckles	73.00		
No. 1 machinery cast	59.00		
Cupola cast	51.00		
Heavy breakable cast	49.00		
ricary meanding cast,	20,100	-	20100

Chicago

_		
No. 1 hvy. melting\$	55,00 to	\$56.00
	47.00 to	48.00
No. 1 factory bundles	61.00 to	62.00
	55.00 to	56.00
No. 2 dealers' bundles	44.00 to	45,00
Machine shop turn,	33.00 to	34.00
Mixed bor, and turn	35.00 to	36.00
Shoveling turnings	35.00 to	36.00
Cast iron borings	35.00 to	36.00
Low phos. forge crops	67.00 to	68.00
Low phos. punch'gs plate	64,00 to	65.00
Low phos. 3 ft and under	63,00 to	64.00
No. 1 RR. hvy. melting	61.00 to	62.00
Scrap rails, random lgth	72,00 to	
Rerolling rails	82,00 to	
Rails 2 ft and under	80,00 to	
Locomotive tires, cut	67,00 to	
Cut bolsters & side frames	62.00 to	
Angles and splice bars	68,00 to	
RR. steel car axles	80,00 to	
RR. couplers and knuckles	66.00 to	
No. 1 machine cast	59.00 to	
Cupola cast.	55.00 to	
Heavy breakable cast	48,00 to	
Cast iron brake shoe	49,00 to	
Cast iron wheel	60,00 to	
	70,00 to	
Malleable		
Stove plate	50.00 to	
Steel car wheels	66,00 to	67.00

Philadelphia Area

. minage-build hired		
No. 1 hvy. melting	\$54.00 to	\$55.00
No. 2 hvy. melting	45.00 to	46.00
No. 1 bundles	54.00 to	55,00
No. 2 bundles	42.00 to	43.00
Machine shop turn	36.50 to	37.50
Mixed bor, short turn	36.50 to	37.50
Cast iron borings		40.00
Shoveling turnings		41.00
Clean cast chem. borings		43,00
Low phos. 5 ft and under		58.00
Low phos. 2 ft and under	59.00 to	60.00
Low phos. punch'gs	59.00 to	60,00
Elec. furnace bundles	56.00 to	57.00
Heavy turnings	50.00 to	51.00
RR. steel wheels	63.00 to	64.00
RR. spring steel	63.00 to	64.00
Rails 18 in. and under	69.00 to	70.00
Cupola cast	51.00 to	
Heavy breakable cast	54.00 to	55.00
Cast iron car wheels	60,00 to	
Malleable	67.00 to	
Unstripped motor blocks	35.00 to	
No. 1 machinery cast	57.00 to	58.00

Cleveland

No. 1 hvy. melting \$	55.00		\$56.00
No. 1 bundles	55.00	to	56.00
No. 2 bundles	39.00		40.00
	55.00		56.00
	32.50		33.50
	38.00		39.00
	38.00		39.00
Cut struct'r'l & plates, 2 ft	00.00	fO	33.00
	60.00	to	61.00
	55.00		56.00
	57.00		58.00
	55,00		56.00
No. 1 RR, heavy melting	62.00	to	63.00
Rails 2 ft and under	77.00	to	78.00
Rails 18 in. and under	78.00	to	79.00
	43.00	to	44.00
	39.00	to	40.00
	55.00		
	55.00		
	52,00		
Malleable	61.00	to	62.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

No. 1 hvy. melting	58.00 to \$59.00
No. 2 hvy. melting	46.00 to 47.00
No. 1 bundles	58.00 to 59.00
No. 2 bundles	42,00 to 43,00
Machine shop turn	34.00 to 35.00
Shoveling turnings	39.00 to 40.00
Cast iron borings	
Low phos. plate	

Buffalo

Dullalo		
No. 1 hvy. melting\$	50.00 to	\$51.00
	40.00 to	41.00
No. 1 busheling	50.00 to	51.00
No. 1 bundles	50.00 to	51.00
No. 2 bundles	37.00 to	38.00
Machine shop turn	30.00 to	31.00
Mixed bor, and turn,	32,00 to	33.00
Shoveling turnings	32.00 to	33.00
Cast iron borings	32.00 to	33.00
Low phos. plate	55.00 to	56.00
Scrap rails, random lgth	57.00 to	58.00
Rails 2 ft and under	65.00 to	66.00
RR. steel wheels	60.00 to	61.00
RR. spring steel	60,00 to	61.00
RR. couplers and knuckles	62,00 to	63.00
No. 1 machinery cast	52.00 to	53.00
No. 1 cupola cast	50.00 to	51.00

Detroit

Brokers buying prices per gros	s ton, en	CRIH:
No. 1 hvy. melting	51.00 to	52,00
No. 2 hvy. melting	41.00 to	42.00
No. 1 bundles, openhearth.	51.00 to	
No. 2 bundles	40.00 to	41.00
New busheling	51.00 to	52.00
Drop forge flashings	50.50 to	51.50
Machine shop turn	29.00 to	30.00
Mixed bor, and turn	32.00 to	33.00
Shoveling turnings	32.00 to	33.00
Cast iron borings	32.00 to	33.00
Low phos. punch'gs, plate.	51.00 to	52.00
No. 1 cupola cast	51.00 to	52.00
Heavy breakable cast	44.00 to	45.00
Stove plate	45.00 to	46.00
Automotive cast	54.00 to	55.00

St. Louis

No. 1 hvy. melting			
No. 2 hvy. melting	42.00		43.00
No. 1 bundles	50.00	to	51.00
No. 2 bundles	38.00	to	39.00
Machine shop turn,	32.00	to	33.00
Cast iron borings	33.00	to	34.00
Shoveling turnings	33.00		34.00
No. 1 RR. hvy. melting	59.00		60.00
Rails, random lengths	66.00	to	67.00
Rails 18 in. and under	70.00	to	71.00
Locomotive tires uncut	62.00	to	63.00
Angles and splice bars	64.00	to	65.00
Std. steel car axles	76.00	to	77.00
RR. specialties	65.00	to	66.00
Cupola cast	54.00	to	55,00
Heavy breakable cast	45.00	to	46.00
Cast iron brake shoes	50.00	to	51.00
Stove plate	48,00		49,00
Cast iron car wheels	53.00		
Rerolling rails	76.00		
Unstripped motor blocks	44.00		45.00

Boston

Brokers buying prices per grou	s ten,	01	cars:
No. 1 hvy. melting	50.50	to	\$51.50
No. 2 hvy. melting	38.00	to	39.06
No. 1 bundles	44.00	to	45.00
No. 2 bundles	34.00	to	35.00
No. 1 busheling	44.00	to	45.00
Elec. furnace, 3 ft & under	53.00	to	54.00
Machine shop turn	26.00	to	27.00
Mixed bor, and short turn.	27.00	to	28.00
Shoveling turnings	29.00	to	30.00
Clean cast chem. borings	31.00	to	32.00
No. 1 machinery cast	45.00	to	46.00
Mixed cupola cast	40.50	to	41.50
Heavy breakable cast	42.00	to	43.00
Stove plate	38.00	to	39.00
Unstripped motor blocks	32.00	to	33.00

New York

Brokers buying prices per gros	is ton, on	cars:
No. 1 hvy. melting	49.00 to	\$50.00
No. 2 hvy, melting	40.00 to	41.00
No. 2 bundles	37.00 to	38.00
Machine shop turn	30,00 to	31.00
Mixed bor, and turn	30.00 to	31.00
Shoveling turnings	34.00 to	35.00
Clean cast chem. borings	29,00 to	30.00
No. 1 machinery cast	48.00 to	49.00
Mixed yard cast	45.00 to	46.00
Charging box cast	45.00 to	46.00
Heavy breakable cast	45.00 to	46.00
Unstripped motor blocks	34.00 to	35.00

Birmingham

No. 1 hvy. melting\$	42.00 to	\$43.00
No. 2 hvy. melting	40.00 to	41.00
No. 1 bundles	42.00 to	43.00
No. 2 bundles	34.00 to	35.00
No. 1 busheling	42,00 to	43.00
Machine shop turn	27,00 to	28.00
Shoveling turnings	29,00 to	30,00
Cast iron borings	24.00 to	25.00
Electric furnace bundles	51,00 to	52.00
Bar crops and plate	55,00 to	56,00
Structural and plate, 2 ft	54.00 to	55,00
No. 1 RR, hvy, melting	52,00 to	53,00
Scrap rails, random igth	61.00 to	62.00
Rails, 18 in and under	63.00 to	64.00
Angles & splice bars	58,00 to	59.00
Rerolling rails	67.00 to	68.00
No. 1 cupola cast.	51,00 to	-52.00
Stove plate	49,00 to	50,00
Charging box cast	38.00 to	39.00
Cast iron car wheels	39.00 to	40.00
Unstripped motor blocks	41.00 to	42.00
Mashed tin cans	15.00 to	16.00
MINCHEST THE COMES	*****	× 4500

Cincinnati

Cincinnati		
Brokers buying prices per group	s ton, on	cars:
No. 1 hvy, melting	52.50 to	\$53.50
No. 2 hvy, melting	44.50 to	45.50
No. 1 bundles	52.50 to	53.50
No. 2 bundles	40.50 to	41.50
Machine shop turn	32.50 to	33.50
Mixed bor, and turn,		35.50
Shoveling turnings	35.50 to	36.50
Cast iron borings		35.50
Low phos. 18 in. & under	56.50 to	57.50
Rails, random lengths	61.00 to	62.00
Rails, 18 in. and under	69.50 to	70.50
No. 1 cupola cast	46,00 to	47.00
Hvy. breakable cast		47.00
Drop broken cast		56.00

San Francisco

	42.00
	44.00
	35.00
	29.00
	26.00
* * +	28.00
	45.00
	48.00

Los Angeles

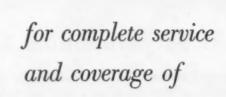
No. 1 hvy. melting			\$44.0
No. 2 hvy. melting		* *	40.0
No. 1 bundles	* *		43.0
No. 2 bundles			33.0
			29.0
Machine shop turn		* *	25.0
Shoveling turnings			24.6
Cast iron borings			24.6
Elec. furn. 1 ft and under			44.0
No. 1 RR. hvy. melting	* *		44.0
No. 1 cupola cast			46.0
No. 1 cupola cast.	* *	* *	46
C 111.			

Seattle

	45.00
	42.00
	31.00
	27.00
	45,00
Mixed yard cast	45.00

Hamilton, Ont.

No. 1 hvy. melting		\$43.00
No. 2 hvy. melting		38.00
No. 1 bundles		43.00
No. 2 bundles	****	35.00
Mixed steel scrap	****	37.0
Bushelings		33.5
Bush., new fact., prep'd . Bush., new fact., unprep'd		37.0
Machine shop turn		21.0
Short steel turn		24.0
Mixed bor, and turn		22.0
Rails, rerolling		51.0
Cast scrap	****	50.0



STAINLESS and ALLOY STEEL SCRAP

of every analysis consult our nearest office



uria Brothers and Company, Inc.

main office PHILADELPHIA NATIONAL BANK BUILDING, Phila. 7, Pa.

DETROIT (ECORSE).

BIRMINGHAM, ALA. BOSTON, MASS. BUFFALO, N. Y. CHICAGO, ILLINOIS

DETROIT, MICHIGAN

LOS ANGELES, CAL. NEW YORK, N. Y. HOUSTON, TEXAS PITTSBURGH, PENHA. LEBANON, PEHNA. PHEBLO, COLORADO

MONTREAL, CANADA

READING, PENNA. ST. LOUIS, MISSOURI-SAN FRANCISCO, CAL. SEATTLE, WASH.

IMPORT & EXPORT - LIVINGSTON & SOUTHARD, INC., 99 Park Ave., New York, N. Y. & Cable Address: FORENTRACO

Reasons For Aluminum Strike

Premium pay and working rules were chief bones of contention between USW and Alcoa . . . 47 pct or about 2500 tons per day output lost . . . AWI signs earlier.

◆ PREMIUM pay and working rules were two key reasons the United Steel Workers struck Aluminum Co. of America.

Premium pay for Sunday became an issue because, although steel workers won this concession just this year, aluminum workers had it in the old contract. The USW sought to win premium pay for Saturday as well as Sunday for aluminum workers.

Some of the working rules which became bones of contention include use of outside help for contract work and transfers inside the plant.

With these issues disposed of, the settlement would be expected to follow steel's three-year 46ϕ package.

Aluminum Workers International earlier had reached agreement along these lines. Alcoa plants which thus had no work stoppage include: Massena, N. Y., smelter; Vancouver, Wash., smelter; Wenatchee, Wash., smelter; Chillicothe, O., cookware; Cressona, Pa., extrusions; E. St. Louis, Ill., alumina; Lafayette, Ind., extrusions; Lancaster, Pa., screw machine.

At Reynolds Metals, 12 plants with 7000 workers continued to operate. These include the smelters at Listerhill, Ala., and Longview, Tex., with a combined capac-

ity of over 112,000 tons of primary aluminum.

Kaiser Aluminum & Chemical's contract does not expire until Aug. 31. Talks have already begun, and it is expected that Kaiser and the union will come to agreement along the lines of the Alcoa and Reynolds pacts.

Anaconda Aluminum is unaffected since its workers are represented by Mine, Mill & Smelter Workers union.

The strike involved 47 pct of aluminum primary production, amounting to roughly 2500 tons per day.

Aluminum demand, while still exceeding supply, had fallen off slightly preceding the strike. Probably hit hardest was the building industry. Alcoa estimates that in 1955, 24 pct of its shipments went to this industry.

Aluminum prices will rise after the strike settlement.

Reports from Washington indicate that the Eisenhower administration has been on top of the situation. A high mobilization official says the government received no reports of defense orders being hampered because of short supplies. Indications are that the government might have forced a settlement were defense contractors hurt.

COPPER... Copper prices closed ranks slightly when custom smelters boosted their price by ½¢ per lb, to 39¢. The London Metals Exchange also showed a tendency to strength, with its price rising to about the same as custom smelters. This is only 1¢ below U. S. Producers price. Although it is too soon to draw definite conclusions, this is considered a step in the direction of a more stable copper market.

On the other side of the ledger, there have been reports of strikes and possible strikes which could hurt the progress being made toward stability. The large Roan Antelope mine in Rhodesia reports that 8000 workers have walked off the job in protest against changes in paying methods and employment status.

Unconfirmed reports from Chile indicate that workers at the Anaconda Potrerillos mine had taken a strike vote, the results of which were not known.

The Bureau of Mines, has reported that according to preliminary studies, ore from four Alaskan mineral deposits can be handled in a standard manner to produce commercial copper concentrates. Copper recovery ranged from 79 pct to 95 pct with standard flotation techniques, depending on the site. The highest grade concentrate obtained from the sites assayed over 36 pct copper.

TIN . . . Price remains firm, but lower than the \$1.00 per lb it reached last week. Reason is probably the fact that the Malayan situation has improved, at least temporarily.

The Malayan Mining Employees Union has agreed to submit its demands to mediation by a third party, thus removing the immediate threat of a strike. Information about who the third party might be has not yet been made public. Government will no doubt enter.

LEAD . . . Latest report from the American Bureau of Metal Statistics indicates that stocks of refined metal at smelters and refineries on July 1, were definitely less than a month previous; 36,499 tons to a previous 39,558 tons. However the latest figure is in line with the 34,432 tons on hand at that time in 1955.

Receipt of lead in form of ore or scrap by smelters was also off, 52,338 tons collected in month of June as compared to 55,902 during May. However this was higher than the 47,449 tons taken in during June, 1955. Total receipts for the first half were 311,871 tons.

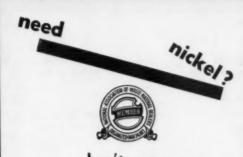
Daily Nonferrous Metal Prices

(Cents per 1b except as noted)

	Aug. I	Aug. 2	Aug. 3	Aug. 4	Aug. 6	Aug. 7
Copper, electro, Conn.	40.00	40.00	40.00	40.00	40.00	40.00
Copper, Lake, delivered	40.00	40.00	40.00	40.00	40.00	40.00
Tin, Straits, New York	98.75	98.50	98.50		99.00	99.00*
Zinc, East St. Louis	13.50	13.50	13.50	13.50	13.50	13.50
Lead. St. Louis	15.80	15.80	15.80	15.80	15.80	15.80

Note: Quotations are going prices.

*Tentative



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We are meticulous sorters, packers and graders of nickel and nickel alloys.

Nickel Cathodes
Nickel Scrap

Inconel Monel

Nichrome

High Alloy Stainless

THEODORE SALL

2117 EAST YORK STREET PHILADELPHIA 25, PA. GARFIELD 6-5000



Popular package is 8-ez. can fitted with Bakelite cap holding soft-hair brush for applying right at bench; metal surface ready for layout in a few minutes. The dark blue background makes the scribed lines show up in sharp relief, prevents metal glare. Increases efficiency and accuracy.

Write for sample

THE DYKEM COMPANY
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END NIGHT CLEANUP & MORNING REBLUING
DYKEM HI-SPOT BLUE NO. 187 is used to locate high spots
when scraping bearing surfaces. As it does not dry,
it remains in condition on work indefinitely, saving
craper's time. Intensely blue, smooth paste
spreads thin, transfers clearly. No grit; noninjurispreads thin, transfers clearly. No grit; noninjurispreads thin, transfers clearly. No grit; noninjuriwhite for free sample tube on company letterhead.
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THE DYKEM CO., 2303G NORTH 11TH ST., ST. LOUIS 6, MO.

WIRE—STRIP, COILED FOR ELECTRIC FUSE ELEMENTS
EYELETS ALSO BRASS OR STEEL
THE PLATT BROS. & CO., WATERBURY, CONN.



MILL PRODUCTS

(Cents per lb, unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed) Flat Sheet (Mill Finish) and Plate ("F" temper except 6061-0)

Alloy	.032	.081	.136-	.25 0 -
1100, 3003	42.3	40.2	39.0	38.0
5052	49.8	44.9	43.2	41.4
60 61-0	46.9	42.7	40.9	40.8

Extruded Solid Shapes

Factor	6063 T-5	6062 T-8
6- 8	43.1-44.8	58.1-61.7
12-14	43.8-45.2	59.0-63.3
24-26	46.8-47.2	69.2-73.6
36-38	55.1-55.7	92.0-95.8

Screw Machine Stock-2011-T-3

Size"	34	36-36	%-1	114-114
Price	56.0	54.9	53.6	51.6

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
,019 gage	\$1.310	\$1.742	\$2.175	\$2.685
,024 gage	1.630	2.177	2.707	3.247

MAGNESIUM

(f.o.b. shipping pt., carload frt, allowed) Sheet and Plate

Type→ Gage→	.250- 3.00	.250- 2.00	.188	.081	.032
FS1 Stand, Grade		65.6	66.5	78	100
FS1 Spec.		88.9	91.1	103.5	163.1
Tread Plate		67.8	68.9		
Tooling Plate	70.2				

Extruded Shapes

factor->	6-8	12-14	24-28	36-38
Comm. Grade	66.4-	67.5-	72.1-	84.9-
(FS)	69.0	69.6	72.7	85.8
Spec. Grade	81.4-	82.8-	87.1-	99.9-
(AZ31B)	84.0	84.6	87.7	

Alloy Ingot

NICKEL, MONEL, INCONEL

(Base prices, f.	o.b. mill)	
"A" Nickel	Monel	Incone
Sheet, CR 102	83	99
Strip, CR 102	92	125
Rod, Bar, HR 87	74	98
Angles, HR 87	74	93
Plate, HR 97	87	95
Seamless tube 122	110	153
Chat blooks	71	

COPPER, BRASS, BRONZE

(Freight included on 500 lbs)

	Sheet	Wire	Rod	Tube
Copper	61.63			61.82
Bram, 70/30	52.10	52,64		55.01
Bram, Low	55.85	56,39	55.75	58.66
Bram, R L	57.19	57.73	57.13	60.00
Brass, Naval	55.72		50.03	58.88
Munta Metal	53.84	47.85	49.65	
Comm. Bs.	59.08	59.62	59.02	61.64
Mang. Bs.	59.46		53.56	
Phos. Bs. 5%	79.58		80.08	

TITANIUM

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, \$12.10\$12.60; alloy, \$15.00-\$15.75; Plate, HR, commercially pure, \$10.00-\$10.50; alloy, \$11.50-\$12.00. Wire, rolled and/or drawn, commercially pure, \$9.00-\$11.50; alloy, \$11.50; Bar, HR or forged, commercially pure, \$7.56-\$7.80; alloy, \$7.56-\$7.75.

PRIMARY METAL

(Cents per lb, unless otherwise noted) Aluminum ingot, 98+%, 10,000 lb.
freight alloyed
Aluminum pig 24.00
Antimony, American, Laredo, Tex. 33.50
Beryllium copper, per lb conta'd Be. \$43.00
Beryllium aluminum 5% Be, Dollars
per lb contained Be\$74.75
Bismuth, ton lots\$ 2.25
Cadmium, del'd \$ 1.70
Cobalt, 97-99% (per lb) \$2.60 to \$2.67
Copper, electro, Conn. Valley 40.00
Copper, Lake, delivered 40.00
Cold II C Wrong per trop of \$25.00
Gold, U. S. Treas., per troy oz\$35.00
Indium, 99.9% dollars per troy oz. \$ 2.25
Iridium, dollars per troy oz\$90 to \$100
Lead, St. Louis
Lead, New York 16.00
Magnesium, 99.8+%, f.o.b. Velasco,
Tex., 10,000 lb, pig 33.75
ingot 34.50
ingot
Mercury, dollars per 76-lb flask,
f.o.b. New York\$255 to \$257
Nickel electro 64.50
Nickel oxide sinter at Copper
Cliff, Ont., contained nickel 60.75
Palladium, dollars per troy oz \$28 to \$24
Platinum, dollars per troy oz. \$103 to \$105
Silver, New York, cents per troy oz. 90.125
Tin, New York99.00*
Titanium sponge, grade A-1, \$2.70 to \$3.00
Zinc. East St. Louis
Zinc, New York
Zirconium sponge\$10.00
*Tentative.

REMELTED METALS

Brass Ingot

	(0	Tenta	1	De	61	•	1	ь	1	1	el	4	27	e	r	80	t.		c	α	r	le	26	30	is)
		ingo															,									
		115					×	×		*		×	*		*											37.75
No).	120	í.																							36.50
		123						*		,			*										*			35.00
80-1	0-	10 in	g	0	t																					
N	٥.	305	,	. ,													÷	*								41.00
		315																								39.25
88-1	0-	2 ing	0	t.																						
		210								×					×		*	,		*	×		*	á		52.75
		215			6			*							*	,				,					*	48.50
N	0.	245					*				*			,												43.50
Yell	WO	inge	01	t																						
N	0.	405								*																29.75
		nese																								
N	D.	421								,																33.00
				4	M	١.		_	2.		101	_		1			_	_								

(Cents per lb del'd 30,000 lb and over)
95-5 aluminum-silicon alloys
0.30 copper max27.75-28.75
0.60 copper max
Piston alloys (No. 122 type) 27.00-28.00
No. 12 alum. (No. 2 grade) 27.00-28.00
108 alloy
195 alloy
13 alloy (0.60 copper max.)27.50-28.50
AXS-679

Steel deoxidizing aluminum, notch bar

	granuk							
Grade	1-95-97 1/2	96						.26.00-27.00
Grade	2-92-95%							.25.00-26.00
Grade	3-90-92%					. *	×	.24.00-25.00
Grade	4-85-90%		×	×				.23.50-24.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per	lb for
shipments of 20,000 lb and of Heavy	Turnings
Copper 36	35 1/4
Yellow brass 271/4	25 1/4
Red brass 31%	311/6
Comm. bronze 33 1/4	32 %
Mang. bronze 25 1/4	24 1/2
Yellow brass rod ends 27	
Custom Smoltone Sanas	

(Cents per pound carload lots, delivered

ĸ.	No 1 conner	wire	35
	Ado. 7 cobber	WALCO	
	No. 2 copper	wire	33 1/2
	Light copper		31
	*Refinery bra	188	31
	* Dry coppe	er content.	

Ingot Makers Scrap

(Cents per pound carload lots, del- to refinery)	vered
No. 1 copper wire	35
No. 2 copper wire	3334
Light copper	31
No. 1 composition	29 1/2
No. 1 comp. turnings	29
Hvy. yellow brass solids	20
Brass pipe	21
Radiators	23
Aluminum	
Mixed old cast 18 -	-19 -20
Mixed turnings, dry 19 -	-20

Dealers' Scrap (Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

copper and pruss	
No. 1 copper wire	$32\frac{1}{2} - 33$
No. 2 copper wire	
Light copper	
Auto radiators (unsweated)	
No. 1 composition	
No. 1 composition turnings	
Unlined red car boxes	
	$19\frac{1}{2} - 20$
Clean heavy yellow brass	17 -1712
Brass pipe	211/2-22
New soft brass clippings	23 -23 1/2
No. 1 brass rod turnings	20 1/2 21

Aluminum

Alum, pistons and struts	8	- 836
Aluminum crankcases	13	-1336
1100 (2S) aluminum elippings		
Old sheet and utensils		
Borings and turnings	9	- 91/2
Industrial castings	13	-131/2
2024 (24S) clippings	16	-16 1/2

Zinc

Zinc .	
New zinc clippings	71/2-8
Old zinc	4 1/2 - 5
Zinc routings	2 1/4 - 3
Old die cast scrap	21/2-21/4
Nickel and Monel	
Pure nickel clippings	\$1.65-\$1.90
Clean nickel turnings	\$1.50
Nickel anodes	\$1.65-\$1.90
Nickel rod ends	\$1.65-\$1.90
New Monel clippings	75-85
Clean Monel turnings	60-70
Old sheet Monel	65-75
Nickel silver clippings, mixed	21
Nickel silver turnings, mixed	18
Transfer and a second second	

read	
Soft scrap lead	121/2-13
Battery plates (dry)	
Batteries, acid free	436

Miscellaneous Block tin 80 —81

NO. 1 pewter	
Auto babbitt 42 -4214	í
Mixed common babbitt 13 13 4	į
Solder joints 18 —181	į
Siphon tops	•
Small foundry type 15 1/4 -15 1/4	ć
Monotype 141/2-15	
Lino. and stereotype 13 -134	
Electrotype 1214-124	
Hand picked type shells 10 -104	Į
Lino. and stereo. dross 54-5%	ı
Electro. dross 44-44	į

	STEEL								b. mill, in cents	per lh., unless	otherwise n	oted. Extr	as apply.	
	PRICES	BILLE	SLABS	DOMS,	PIL- ING		SHAPE				STR	RIP		
1	(Effective Aug. 7, 1956)	Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide- Flange	Hot- rolled	Cold- rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot- rolled	Alloy Cold- rolled
	Bethlehem, Pa.			\$96.00 B3		4.65 B3	6.80 B3	4.65 B3						
	Buffale, N. Y.	\$68.50 B3	\$84.50 R3, B3	\$96.00 R3, B3	5.45 B3	4.65 B3	6.80 B3	4.65 B3	4.325 R3,B3	6.25 B3 6.25 R7,S10	6.825 B3	9.10 B3		
	Claymont, Del.													
	Harrison, N. J.													13.45 C
	Conshohocken, Pa.								4.775 A2	6.79 A2	6.825 A2			
	New Bedford, Mass.									6.70 R6				
EAST	Johnstown, Pa.	\$68.50 B3	\$04.50 B3	\$96.00 B3		4.65 B3	6.80 B3							
(M)	Boston, Mass.									6.89 78				13.80 T
	New Haven, Conn.									7.30 D1 6.70 A5				
	Phoenixville, Pa.					5.85 P2		5.85 P2			-			
	Sparrows Pt., Md.							-	4.325 B3	6.25 B3	6.425 B3	9.10 B3		
	Bridgeport, Wallingford, Conn.	\$73.50 N8	\$89.50 N8						4.625 N8	6.70 W//			7.50 N8	-
	Pawtucket, R. I.								-	6.80 N7, A5				13.80 /
_	Worcester, Mass.													N7
	Alton, III.								4.85 <i>L1</i>					
	Ashland, Ky.								4.325 A7					
	Canten-Massillen, Dever, Ohio		\$86.50 R3	\$96.00 R3					7	6.85 G4				13.45 G4
	Chicago, III.	\$68.50 UI	\$84.50 R3, UI 89.50 W8	\$96.00 R3, UI \$101.00 W8	5.45 UI	4.60 U1, 4.85 W8	6.74 UI, YI	4.60 UI	4.725 A1 4.575 W8 4.325 N4	6.35 T8 6.95 AI			7.45 W8	13.45 T
	Cleveland, Ohio									6.25 A5, J3		9.30 A5		13.45 A
	Detroit, Mich.			\$96.00 R5					4.425 G3,M2	6.35 D2,G3, M2,P11 6.95 D1	6.525 G3	9.20 D2, G3		
	Duluth, Minn.							-						
ST	Gary, Ind. Harber, Indiana	\$68.50 UI	\$84.50 UI	\$96.00 UI,	6.45 /3	4.60 UI	6.75 U1,	-	4.325 /3,	6.35 /3	6.425 /3,	9.30 Y/	7.20 Y1,	
WEST				YI		13	13		UI,YI	6.25 YI	UI, YI		UI	
DLE	Sterling, III.								4.425 N4					
MIDDLE	Indianapolis, Ind.									6.48 CS				
_	Newport, Ky.												7.20 N5	
	Middletown, Ohio									6.45 A7				
	Niles, Warren, Ohio Sharen, Pa.		\$94.50 C10						4.325 SI, R3	6.25 SI, R3,T4	6.425 SI, R3	9.10 SI, R3	7.20 SI	13.45 SI
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	\$68.50 UI, J3	\$84.50 J3, UI,CII	\$96.00 UI, CII	5.45 UI	4.60 UI, J3	6.75 UI, J3	4.60 U1	4.325 P6	6.25 57,84			7.20 S9	13.45 .59
	Pertameuth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.					4.60 W3			4.325 W3	6.25 F3,W3	6.425 W3	9.10 W3	1/4	
	Youngstewn, Ohio			\$96.00 YI, CIO			6.75 YI		4.325 UI, YI	6.25 Y1,C5	6.425 UI, YI	9-30 Y/	7.20 UI, YI	13.45 C5
-	Fontana, Cal.	\$82.50 K1	\$100.50 KI	\$127.00 KI		5.30 K1	7.90 K1	5.90 K1	5.575 <i>K1</i>	8.70 K1	8.025 K1		9.65 K1	
	Geneva, Utah		\$84.50 C7			4.60 C7	6.75 C7							
	Kansas City, Mo.					4.70 S2	6.85 S2				6.675 SZ		7.45 S2	
	Los Angelos, Torrance, Cal.		\$94.00 B2	\$116.00 B2		5.30 C7, B2	7.45 B2		5.875 C7 B2	8.99 CI			8.40 B2	
WEST	Minnequa, Colo.					4.90 C6			5.425 C6	-			-	
	Portland, Ore.					5.35 02							TT-11	
	San Francisco, Niles. Pittsburgh, Cal.		\$94.00 82			5.25 B2, P9	7.40 B2		5.875 B2, C7					
	Seattle, Wash.		\$98.00 B2			5.35 B2	7.50 B2		5.325 B2					
	Atlanta, Ga.								4.525 A8					
SOUTH	Fairfield, Ala. City, Birmingham, Ala.	\$68.50 72	\$84.50 72			5.10 C/6 4.60 R3, T2	6.75 T2		4.325 R3,77 4.825 C/0		6.425 T2			
2	Houston, Lone Star,	\$74.50 L3	\$89.50 S2	\$101.00 S2		4.70 S2	6.85 S2							-

	STEEL										WIRE			BLACE
F	PRICES				S	HEETS					ROD	TINPL	ATE†	PLATE
A	(Effective lug. 7. 1956)	Hot-rolled 18 ga. & hvyr.	Cold- rolled	Galvanized 10 ga.	Enamel- ing /2 ga.	Long Terme 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot- rolled /9 ga.		Cokes* 1,25-lb. base box	Electro* 0.25-lb. base box	Holloware Enameling 29 ga.
	BetMeham													
	Buffalo, N. Y.	4.325 B3	5.325 B3				6.375 B3	7.875 B3			5.375 W6	† Special conterns deduct	ated mfg. S0¢ from	
	Clayment, Del.											1.25-lb. coke price. Can-m blackplate 55	base bex	
	Ceatesville, Pa.											deduct \$2.20	from 1.25-lb.	
	Conshohecken, Pa.	5.775 A2	4.775 A2				6.825 A2					* COKES:	r. 1.50-lb.	
	Harrisburg, Pa.											add 25¢. ELECTRO:	0.50-lb. add	
CAS	Hartford, Conn.											25¢; 0.75-lb. 1.00-lb. add 1 ential 1.00 lb	add 65¢; \$1.00. Differ-	
3	Johnstown, Pa.										5.375 B3	add 65¢.	/0.25 Ib.	
	Fairless, Pa.	4.375 UI	5.375 UI				6.425 UI	7.925 UI				\$9.70 UI	\$8.40 UI	
	New Haven, Cenn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.325 B3	5.325 B3	5.85 B3			6.375 B3	7.875 B3	8.60 B3		5.475 B3	\$9.70 B3	\$8.40 B3	
	Worcester, Mass.										5.675 A5			
	Trenten, N. J.				-			-	-					-
-	Alten, III.		-		_			-	_		5.90 L1			_
	Ashland, Ky.	4.325 A7		5.85 A7	5.90 A7			-	-					
	Canton-Massillon,			5.85 RI,		-								
	Dover, Ohio	4795 41		R3			4 39F 1/1	-	-		E 275 MA			
	Chicago, Joliet, III.	4.725 A/ 4.575 W6					6.375 UI				5.375 N4 5.375 A5, R3			
	Sterling, III.				-						5.475 N4	-		
	Cleveland, Ohio	4.325 J3, R3	5.325 /3, R3		5.90 R3		6.375 <i>J3</i> , <i>R3</i>	7.875 J3,			5.375 A5			
	Detroit, Mich.	4.425 G3, M2	5.425 <i>G3</i> 5.325 <i>M2</i>				6.475 G3	7.975 G3						
	Newport, Ky.	4.725 N5	5.925 NS	5.85 N5		-								
E WEST	Gary, Ind. Harber, Indiana	4.325 /3, UI, YI	5.325 <i>I</i> 3, <i>UI</i> , <i>YI</i>	5.85 UI, 13	5.90 UI, 13	6.25 UI	6.37\$ YI, UI,I3	7.875 UI, YI			5.375 Y/	\$9.60 UI, YI	\$8.30 I3, UI, YI	6.65 UI. YI
MIDDLE	Granite City, III.	4.95 GZ	6.625 G2	6.65 G2	6.60 G2	-							\$8.40 GZ	7.25 GZ
M	Kokomo, Ind.			6.35 C9							5.825 C9			
	Mansfield, Ohio	4.325 E2	5.325 <i>E2</i>			6.25 E2								
	Middletown, Ohio		5.325 A7	5.85 A7	5.90 A7	6.25 A7								
	Niles, Warren, Ohio Sharon, Pa.	4.325 SI, R3,N3	5.325 R3, N3	5.85 R3 6.85 N3	5.90 N3	6.25 N3	6.375 SI,	7.875 R3					\$8.30 R3	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.325 J3, U1,P6	\$.325 /3, UI,P6	5.85 UI	\$.90 U1, A7		6.375 J3, UI	7.875 UI	8.60 UI		5.025 P6 5.375 A5	\$9.60 J3, UI	\$8.30 J3, UI	6.65 UI
	Portsmouth, Ohio	4.725 P7	5.925 P7								5.725 P7			
	Weirten, Wheeling, Fellansbee, W. Va.		5.325 W3,	5.85 H/3,		6.25 W3,	6.375 W3	7.875 W3				\$9.60 W3,	\$8.30 W3, W5	6.65 F3,
	Toungstown, Ohio	4.325 UI,	W5,F3	W5	5.90 Y/	W5	6.375 UI.	7.875 YI			5.375 Y/	W5	W)	10'5
_		YI					YI		-					
	Fontana, Cal. Geneva, Utah	5.575 K1	7.075 K1	-	-		7.625 <i>K1</i>	9.625 KI	-	-		\$10.35	\$9.85	\$7.75
	Kansas City, Mo.	4.425 C7		-	-			-	-	-	5.625 S2			-
	Les Angeles.		-	-	-	-	-		-		6.175 B2		-	-
WEST	Terrance, Cal.													
*	Minneque, Colo. San Francisco, Niles. Pittsburg, Cal.	5.825 C7	6.275 C7	6.60 C7				-			5.625 C6 5.675 C7	\$10.35 C7	\$9.05 C7	-
	Seattle, Wash.										-			
_	Atlanta, Ga.	-		-	-	-	-							-
SOUTH	Fairfield, Ala. Alabama City, Ala.	4.325 R3, 72	5.325 T2	5.85 R3, 72			6.375 72			\$.625 R3	5.825 R3 5.375 T2	89.70 72	\$8.40 72	
92	Houston, Tex.										5.625 SZ			

	RON AGE		Italies identify	producers listed	in key at end	of table. Base	prices, f.o.b. m	ill, in cents per	b., unless oti	serwise noted.	Extras apply.	
	RICES			BA	RS				PL	ATES		WIRE
A	(Effective lug. 7. 1956)	Carbon Steel	Reinfore-	Cold Finished	Alloy Hot- rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
	Bethlehem, Pa.				5.575 B3	7.425 B3	6.80 B3					
	Buffalo, N. T.	4.65 B3,R3	4.65 B3,R3	6.30 B5	5.575 B3,R3	7.425 B3,B5	6.80 B3	4.50 B3,R3				6.60 W6
	Clayment, Del.							5.35 C4		6.30 C4	6.725 C4	
	Contesville, Pa.							4.80 L4		6.30 L4	6.725 L4	
	Conshobecken, Pa.							4.95 A2	6.025		7.175 A2	
	Harrisburg, Pa.							5.80 P2	5.575 C3			
	Hartford, Cenn.			6.75 R3		7.725 R3						
ST	Johnstown, Pa.	4.65 B3	4.65 B3		5.575 B3		6.80 B3	4.50 B3		6.30 B5	6.725 B3	6.60 B3
EAST	Fairless, Pa.	4.80 UI	4.80 UI	W//	5.725 U1	2 40 W/40						
	Newark, N. J.			6.70 W10		7.60 W10						
	Camden, N. J.	4 00 8/0		6.85 P10	F 79F 3/9			4 770 N/R		-		
	Bridgeport, Putnam, Conn.	4.80 N8		6.80 W/II	5.725 N8			4.750 N8				
	Sparrows Pt., Md.		4.65 B3					4.50 B3		6.30 B3	6.725 B3	6.70 B3
	Palmer, Worcester, Readville, Mass. Milton, Pa.	5.25 M7	5.25 M7	6.70 W11 6.45 C14 6.70 B5		7.725 A5,B5		4.50 R3				6.90 A5 6.90 W6
	Spring City, Pa.			6.35 K4		7.60 K4						
	Alten, III.	5.20 L1										6.775 <i>L1</i>
	Ashland, Newport, Ky.					1		4.50 A7,N5		6.30 NS		
	Canton-Massillen, Mansfield, Ohio	4.75 R3		6.25 R2,R3	5.575 R3,T5	7.425 R2,R3, T5		4.50 E1				
	Chicago, Jeliet, III.	4.65 UI,R3 4.90 W8 5.15 PI3	4.65 N4, R3 5.15 P13	6.25 B5,W10, A5,L2 6.50 W8	5.575 U1, R3, 5.825 W8	7.425 A5, W10,L2,B5 7.675 W8		4.50 U1,13,R3 4.90 A1 4.75 W8	5.575 U1	6.30 UI	6.725 UI	6.60 A5, R N4, W7
	Cleveland, Ohio	4.65 R3	4.65 R3	6.25 A5,C13		7.425 A5,C13	6.80 R3	4.60 J3,R3	5.575 /3		6.725 R3,J3	6.60 A5, C/3
	Detroit, Mich.	4.75 G3	4.75 G3	5.90 R5 6.45 B5 6.50 P3 6.10 P8	\$.575 R5 5.675 G3	7.425 R5 7.625 B5,P3, P8	6.90 G3	4.40 G3			6.825 G3	
WEST	Duluth, Minn.											6.60 A5
MIDLE W	Gary, Ind. Harber, Crawfordsville	4.65 13, UI , YI	4.65 13, UI, YI	6.25 M5,R3	5.575 <i>13, U1,</i> Y1	7.425 M5, R3	6.80 U1,13, Y1	4.50 13, UI, YI	5.575 /3	6.30 UI, YI	6.725 UI. 12, YI	6.35 M4
Ī	Granite City, III.							5.15 G2				
	Kakomo, Ind.											7.20 C9
	Sterling, III.	4.75 N4	4.75 N4									6.70 N4
	Niles, Warren, Ohio Sharen, Pa.	4.65 R3,C10	A 40 12 111	6.25 C/0	6.25 CIO	7.425 C10	6.80 R3	4.50 S1,R3	n Eve 271	6.30 SI	6.725 SI 6.725 J3, UI	6.60 A5,J
	Pittsburgh, Pa. Midland, Pa.	4.65 J3, U1, CII	4.65 J3, UI	6.25 A5,C8, C11,J3, W10,B4,R3	5.575 UI,CII	7.425 A5,C11, W10,C8,R3	6.80 J3, UI	4.50 J3, U1	5.575 UI	6.30 UI	6.123 33, 01	P6
	Pertamenth, Ohio											7.10 P7
	Weirten, Wheeling, Fellansbee, W. Va.	4.65 18/3						4.56 W3, W5				
	Youngstown, Ohio	4.65 UI, YI, CIO, R3	4.65 UI, YI, R3	6.25 YI, UI	5.575 UI, YI, CIO	7.425 YI,CIO, F2	6.80 UI, YI	4.50 UI, YI, R3		6.30 YI	6.725 Y/	6.60 Y/
	Emeryville, Cal.	5.40 J5	5.40 /5									
	Fentana, Cal.	5.80 K1	5.35 K/		7.175 KI		7.95 <i>K1</i>	\$.65 K1		7.70 KI	7.875 K1	
	Geneva, Utah							4.50 C7			6.725 C7	
	Kansas City, Mo.	4.90 S2	4.90 S2	2 20 P.	5.825 S2		7.05 S2				7.497 83	6.85 S2
WEST	Les Angeles, Terrance, Cal.	5.35 B2,C7	5.35 B2,C7	7.70 R3	6.625 B2		7.50 B2				7.625 B2	7.55 B2
2	Minnequa, Cele.	5.10 C6	5.10 C6					5.35 C6				6.85 C6
	Partiand, Ore.	5.40 02	5.40 02									
	San Francisco, Nilos, Pittsburg, Cal.	5.40 B2,P9	5.35 C7 5.40 B2,P9				7.55 B2					7.55 C7 7.55 C6
	Seattle, Wash.	5.40 B2,P12, N6	5.40 B2,P/2				7.55 B2	5.40 B2		7.20 B2	7.625 B2	
	Atlanta, Ga.	5.15 A8	5.15 A8									6.50 /48
SOUTH	Fairfield, Ala. City, Birmingham, Ala.	4.65 T2,R3 5.15 C/6	4.65 T2,R3 5.15 C/6				6.80 72	4.50 T2,R3			6.725 T2	6.60 R3,
on.	Houston, Ft. Worth, Lone Star, Tex.	4.90 S2	4.90 .52		5.825 S2		7.05 S2	4.85 L3 4.60 S2		6.40 S2	6.825 S2	6.85 S2

Steel Prices (Effective Aug. 7, 1956)

Key to Steel Producers

With Principal Offices

42 Alan Wood Steel Co., Conshohocken, Pa.

43 Allegheny Ludlum Steel Corp., Pittsburgh

44 American Cladmetals Co., Carnegie, Pa.

45 American Steel & Wire Div., Cleveland

46 Angell Nail & Chaplet Co., Cleveland

47 Armoo Steel Corp., Middletown, Ohio

48 Alantic Steel Co., Atlanta, Ga.

49 Jones & Laughlin Steel Corp.

40 Alantic Steel Co., Atlanta, Ga.

BI Babcock & Wilcox Tube Div., Beaver Falls, Pa.

#2 Bethlehem Pacific Coast Steel Corp., San Francisco B3Bethlehem Steel Co., Bethlehem, Pa.

85 Brook Plant, Wickwire Spencer Steel Div.,
Birdeboro, Pa.

CI Calstrip Steel Corp., Los Angeles

C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metals Products Co., Youngstown, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mig. Co., Sharon, Pa.

C7 Columbia Geneva Steel Div., San Francisco

C8 Columbia Steel & Shafting Co., Pittsburgh Continental Steel Corp., Kokomo, Ind.

C9 Continental Steel Corp., Kokomo, 110a.

C10 Copperweld Steel Co., Pittaburgh, Pa.

C11 Crucible Steel Co., Gamerica, Pittaburgh

C12 Cumberland Steel Co., Camberland, Md.

C13 Cuyahoga Steel & Wire Co., Cleveland

C14 Compressed Steel Shafting Co., Readville, Mass.

C15 C. C. Carlson, Inc., Thorndale, Pa.

M7 Milton Steel Products Livin, M1

N1 National Supply Co., Pittaburgh

N1 National Tube Div., Pittaburgh

N1 Niles Rolling Mill Div., Niles, O.

V1 United State Steel Corp., Pittaburgh

U1 United States Steel Corp., Pittaburgh

U2 Universal-Cyclopa Steel Corp., Bridgevill

U3 Ulbrich Stainless Steels, Wallingford, Co.

U3 Ulbrich Stainless Steels, Wallingford, Co.

W1 Wallingford Steel Co., Wallingford, Co.

Washington, P.

DI Detroit Steel Corp., Detroit

D2 Detroit Tube & Steel Div., Detroit

D3 Driver Harris Co., Harrison, N. J.

D4 Dickson Weatherproof Nail Co., Evanston, Ill.

D5 Henry Disston Div., Philadelphia

El Eastern Stainless Steel Corp., Baltimore

E2 Empire Steel Co., Manafield, O. El Empire Steel Co., Mansheld, O.

F1 Firth Sterling, Inc., McKeesport, Pa.

F2 Fitzsimons Steel Corp., Youngstown

F3 Follansbee Steel Corp., Follansbee, W. Va.

GI Globe Iron Co., Jackson, O.

G? Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
C3. Cond. Co., Dover. O.

J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh

J4 Joslyn Mfg. & Supply Co., Chicago

J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal. K2 Keystone Steel & Wire Co., Peoria

K3 Koppers Co., Granite City, Ill.

K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis L2 La Salle Steel Co., Chicago

L3 Lone Star Steel Co., Dallas

No Northwest Steel Rolling Mills, Scattle
No Northwest Steel Rolling Mills, Scattle
No Northwest Steel Co., Pawtucket, R. I.
No Northwest Steel Co., Bridgeport, Conn.
No Wallingford Steel Co., Wallingford, Conn.
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No Wallingford Steel Co., Weitana, Wallingford, Conn.
No Westingford, Conn.
No West P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittaburgh Coke & Chemical Co., Pittaburgh
P5 Pittaburgh Serew & Bolt Co., Pittaburgh

P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit

80 Pacific States Steel Co. Niles Cal.

P10 Precision Drawn Steel Co., Camden, N. J

P11 Production Steel Strip Corp., Detroit

P12 Pacific Steel Rolling Mills, Seattle

P13 Phoenix Mfg. Co., Joliet, Ill.

RI Reeves Steel & Mig. Co., Dover, O.

R2 Reliance Div., Eaton Mig. Co., Massillon, O.

R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., Lehn A. To-R4 Roebling Sons Co., John A., Trenton, N. J.

R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

SI Sharon Steel Corp., Sharon, Pa.

S2 Sheffield Steel Div., Kansas City S3 Shenango Furnace Co., Pittsburgh

S4 Simonds Saw and Steel Co., Fitchburg, Mass. S5 Sweet's Steel Co., Williamsport, Pa.

S6 Standard Forging Corp., Chicago

S7 Stanley Works, New Britain, Conn. S8 Superior Drawn Steel Co., Monaca, Pa

Superior Steel Corp., Carnegie, Pa. 92.

S10 Seneca Steel Service, Buffalo

71 Tonawanda Iron Div., N. Tonawanda, N. Y.
72 Tennessee Coal & Iron Div., Fairfield

M6 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.

72 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton. O.

U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.

U3 Ulbrich Stainless Steels, Wallingford, Conn.

W10 Wyckoff Steel Co., Pittsburgh

WII Worcester Pressed Steel Co., Worcester, Mass.

W12 Wallace Barnes Steel Div., Bristol, Conn. YI Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about \$200 per net ton.

							BUTT	WELD										SEAM	LESS			
	361	In.	941	In.	11	n.	11/4	In.	11/2	In.	2	ln.	21/2	3 in.	2	In.	21/2	ln.	31	in.	31/2	4 In.
STANDARD T. & C.	Blk.	Gal.	Bik.	Gal.	BOL.	Gal.	Blk.	Gal.	Blk.	Gal.	Bik.	Gal.	Bik.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Bik.	Gal.
Sparrows Pt. B3 Youngstown R3 Footlans K1. Pittaburgh J3 Alton, III. L1 Sbaron M3. Fairless N2 Pittaburgh N1 Wheeling W5. Wheatland W4 Youngstown Y1 Lorian N2 Lorian N2 Lorian N2	16, 50 18, 50 6, 00 18, 50 16, 50 18, 50 18, 50 18, 50 18, 50 18, 50 18, 50 18, 50	1.25 1.25 13.25 1.25 1.25 3.25 3.25 3.25 3.25 3.25 3.25	21.50 9.00 21.50 19.50 21.50 21.50 21.50 21.50 21.50 21.50 21.50	5.25 5.25 +9.25 7.25 5.25 7.25 5.25 7.25 7.25 7.25 7	24.00 22.00 24.00 22.00 24.00 24.00 24.00 24.00 23.80	8.75 8.75 +5.75 10.75 8.75 10.75 8.75 10.75 10.75 10.75 10.75 10.75	24.50 26.50 14.00 26.50 24.50 24.50 26.50 26.50 26.50 26.50 26.50	11.50	14.50 27.00 25.00 27.00 25.00 27.00 27.00 27.00 27.00 26.00	+3.00 12.50 10.50 12.50 10.50 12.50	27.50 15.00 27.50 25.50 27.50 25.50 27.50 27.50 27.50 27.50 27.50	11.50 +2.50 13.00 11.00 13.00 13.00 13.00 13.00 13.00 13.00	27.00 29.00 16.50 29.00 27.00 29.00 29.00 29.00 29.00 29.00 29.00 29.00 29.00	10.75 11.75 +1.75 12.75 10.75 10.75 12.75 12.75 12.75 12.75 12.75 12.75 12.75	4.00	+11.	10.50	+6.25 +6.25 +6.25 +6.25	13.00	+3.75 +3.75 +3.75	14.50	+2.25
EXTRA STRONG PLAIN ENDS Sparrows Pt. B3. Toungstown R3. Fairless N2. Forlans K7 Fittsburgh J3 Alton, III. L7 Sharen M3 Pittsburgh N1 Wheeling W5 Wheeling W5 Voungstown V1 Indiana Harbor Y1 Levain N2 Levain N2 Levain N2	21.00 23.00 21.00 10.50 23.00 23.00 23.00 23.00 23.00 23.00 23.00 23.00 23.00	9.25 7.25 9.25 9.25 9.25 9.25 9.25 9.25	27.00 25.00 14.50 27.00 25.00 27.00 27.00 27.00 27.00 27.00 27.00 27.00 27.00	11.25 11.25 11.25 11.25 11.25 13.25 13.25 13.25	29.00 27.00 16.50 29.00 27.00 29.00 29.00 29.00 29.00 29.00	14.75 14.75 16.75 14.75 16.75 16.75 16.75 16.75 16.75	29.50 27.50 17.00 29.50 27.50 29.50 29.50 29.50 29.50 29.50 29.50	14.00 13.50 15.50 13.50 15.50 15.50 15.50	30.00 28.00 17.50 30.00 28.00 30.00 30.00 30.00 30.00 29.00	15.09 14.50 16.50 16.50 16.50 16.50	30.50 28.50 18.00 30.50 28.50 30.50 30.50 30.50 30.50 30.50 29.50	15.50 15.00 17.00 15.00 17.00 17.00 17.00 17.00 17.00	31.00 29.00 18.50 31.00 29.00 31.00 31.00 31.00 31.00	14.75 13.75 15.75 13.75 15.75 15.75 15.75 15.75 15.75	\$.5d 5.5d 5.5d	0 +8.50 0 +8.50 0 +8.50	13.00	+2.75 +2.75 +2.75 +2.75	15.50 15.50	+0.25 +0.25 +0.25	20.54	4.7

Threads only, buttweld and seamless 2½ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount. Galvanised discounts based on sinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1½, 1½ and 2-in., 1½, and 3-in., 1 pt., e.g., zinc price range of over 11¢ to 13¢ would lower discounts; sinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price new 13.36¢ per lb.

TOOL STEEL

F.o.3	. mill					
W	Cr	Y	Mo	Co	per lb	SAE
18	4	1	-	-	\$1.60	T-1
18	4	1	-		2.305	T-4
18	4	1	-	_	1.765	T-3
1.5	4	1.5	8	_	.96	M-1
	4		6	-	1.35	M-3
	- 6	3		_	1.105	M-3
High	-carb	on chi	romiu	m	.77 D	-3, D-6
Off	harde	ned m	anga	Deme.	.42	0-1
BDec	ial ca	rbon			.39	W-1
Ext	TA CAT	bon .			.33	W-1
Reg	ular c	arbon			.275	W-1
W	areho	use pr	rices -	OB AD	d east o	f Mis-
Miss	ippi a slasipp	L 66 E	per	lb hi	gher. W	est of

CLAD STEEL

WARE-

prices,		

		Plate	(A3, J2	, L4)	Sheet (12)
	Cladding	10 pet	15 pet	20 pet	20 pet
	304	39.39	33,15	36.05	32.50
1	316	35,50	38.45	41.40	47.60
1	321	32.00	34.85	37.75	37.25
ł	347	34, 40	37.90	41.40	48.25
å	405	25.80	29.60	33.35	
	410, 420	25.39	29.10	32.85	

CR Strip (\$9) Copper, 10 pct, 2 sides, 42.15; 1 side, 33.40.

ELECTRICAL SHEETS

22-Gage	Het-Relled	Cold-R (Coiled or C	
F.e.b. Mill Cents Per Lb	(Cut Lengths)*	Semi- Processed	Fully Processed
Field	9.00	5.60	
Armature	9.95	10.30	10.10
Elect	10.55	10.90	10.78
Motor	11.55	11.90	11.70
Dyna ma	12.45	12.10	12.66
Trans. 72	12.80	13.05	13.55
Trans. 65	13.35	Grain (Driented
Trans. 58	13.85	Trans. 80.	17.41
Trans. 52	14.85	Trans. 73.	17.91

Producing points: Beach Bettom (W5); Brackenridge (A3); Granite City (G2); Indiana Harber (I3); Manufold (E2); Newport, Ky. (N5); Niles, O. (N3); Vandergrift (U1); Warren, O. (R3); Zaneaville (AI). * Coils 75¢ higher.

LAKE SUPERIOR ORES

51.50% Pe natural content, delivered lower Lake ports. Prices for 1956 season. Preight changes for seller's account. Gross Tom

Openhearth	lump		*					×	*		è	*	\$12.1
Old range,	bessem	6	r									*	11.8
Old range,	nonbes	86	83	m	0	r							11.1
Mesabi, bes	semer												11.0
Mesabi, nor	bessem	0	r										10.8
High phost													10.8

Metropolitan Price, dollars per 100 lb.

HOUSES		Sheets		Str	rip	Plates	Shapes	Ba	rs		Alloy	Bara	
**		-			-	-				1		e	6
Coles Coles	Hai-Rolled	Cold-Rolled	Galvanized (10 gage)	Het-Relled	Cold-Rolled		Structural	Hot-Relled	Cold- Finished	Het-Relled 4615 As Relled	Hot-Relied 4140 Annealed	Cold-Drawn 4615 As rolled	Celd-Drawn 4140 Annealed
Baltimore\$.16	7.31	8.32	8.37	7.65		7.63	7.93	7.61	8.62	14.38		16.36	16.29
Birmingham15	6.80-		8.85	7.06-	*****	6.99-		7.08-	9.35		13.96		16.49
Besten	7.63 8.22- 8.72	8.50 9.17- 9.57	10.42-	7.71 8.31- 8.81	11.10	7.95 8.51- 9.01	7.93 8.37- 8.87	7.77 8.37- 8.81	9.96-	14.65	14.10-	17.61	17.31
Buffalo15		8.65	10.66	8.00		8.30	8.25	8.00	8.55	14.70	14.15	17.50	17.20
Chicago 1!	7.78	8.64	9.75	7.86	9.55	8.10	8.08	7.92	8.40	14.35	13.80	17.15	16.85
Cincinnati1!	7.90	8.63	9.75	8.10	*****	8.39	8.55	8.16	8.80	14.60	14.05	17.40	17.10
Cleveland15	7.78	8.64	9.10-	7.96		7.77-	8.41	7.98	8.65	13.41- 14.41	13.36- 13.86	16.26- 17.20	16.91
Denver			11.22	8.90		8.60	8.75	8.90	9.82	******			17.97
Detroit 1	7.97	8,83	10.03	8.14		8.38	8.55	8.20	8.69	14.59	14.04	17.39	17.09
Heusten	. 7.85	8.75	10.49	8.15	****	8.00	8.20	8.25	10.10-	14.35	15.90	17.15	17.05
Kansas City 2	8.45	9.31	10.42	8,53		8.77	8.75	9.12	9.95	15.02	14.47	17.82	17.52
Les Angeles 1	8.25	10.10	11.10	8.60		8.85	8.40	8.25	11.00		14.50		18.10
Momphis1	8.10	8.96	*****	8.18		8,42	8,40	9.05	9.65				
Milwaukee1 New Orleans1	7.87	8.73	9.34- 9.84	7.45- 7.95 7.45		7.69 8.19 7.40	8.25	7.51- 8.01 7.50	8.09- 8.59 9.55	14.54	13.39- 13.89	17.24	16.44 16.94
New York 1		1		8.88		8.81	8.71	8.76	10.37	14.72	14 17	17.52	17 99
Norfolk2		1	10.00	7.65	1	-	1	7.65	9.50	-		-	-
Philadelphia 1	1	1	9.51-			7.82	11111	10000	1	1		17.30	16,50
Pittsburgh1	7.94	9.04	10.01	8.59	1	8.32	8.35	7.92	9.12	14.35	13.95	-	17.00
Pertland			10.65	8.00	1	1				14.33	-		17.50
Salt Lake City	8.60	10.15		9.35	1	1	8.15		10.00	******	13.00		11.00
San Francisco				8.45	1	8,40	1	1	11 55		14 50		18.10
Santie			1	8,98	1			1	-		-		1
		1		-	1	1	1	1		1	-	-	
St. Paul	8.07	9.33	10.04	8.00 8.15 8.56	1	8.24 8.39 8.80	8.48	8.21	8.94	14.64			17.14

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1900 to 1999 lb. All others: 2000 to 9999 lb. All EIR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.

Exceptions. (1) 1500 to 9999 lb. (2) 1000 lb or over. (3) \$.25 delivery. (4) 1000 to 1999 lb, \$.35 delivery.

Plus analysis charge.

*Plus analysis charge.

\$Deduct for country delivery.

MERCHANT WIRE PRODUCTS

4	Standard & Cested Nails	Weven Wire Fence 9-151/2 gs.	"T" Fence Pests	Single Lesp Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Ann'ld	Merch. Wire Galv.
F.o.b. Mill	Cel	Cel	Col	Cel	Col	é/lb.	¢/86.
Alabama City R3 Aliquippa, Pa. J3 Atlanta A8 Bartenville K3°	154 169	167 184		177	180	7.60	7.86 7.80 8.128 8.70 7.90
Buffalo W6. Chicage, Ill. N4** Cleveland A6. Cleveland A5. Crawfordaville M4* Denora, Pa. A5. Duluth A5. Fairfield, Ala. 72.	152 157 154 152 152	168 162 162		175 177 175 175	181 175 175	7.50 7.50 7.40 7.60 7.56 7.50	8. 18 8. 28 7. 98 7. 98 7. 99
Houston D7. Houston S2. Johnstown, Pa. B3° Jeliet, Ill. A5.	157 152 152	170 164 162		175	186 175 175 193	7.65 7.40 7.50 8.10	8.05 7.80 8.10 8.50 8.92
Les Angeles B2* Kansas City S3. Minnequa C6. Menessen P6. Meline, Ill. R3. Pittaburg, Cal. C7.	15	162	163	191	195	7.40	8.05 8.15 7.80 8.85
Portamouth P7. Rankin, Pa. A5. So. Chicago R3. S. San Francisco C6. Sparrowa Pt. B3° Struthers, O. Y1. Worcester A5. Williamaport, Pa. S5.	18			12	19	7 60	8.29

Galvanized products computed with zinc at 5¢ per th aceptions: "zinc at 12.5¢ per lb; "" 13¢ zinc.

C-R SPRING STEEL

	CARBON CONTENT								
Cents Per Lb F.e.b. Mill			0.61-	0.81- 1.05					
Bristol, Conn. W12 Buffalo, N. Y. R7 Carnegie, Pa. S9	1777	9 85	110.60	13.85 12.65 12.75	15.38				
Cleveland A5	7,20	9.15	10.70	12.75					
Harrison, N. J. Cll Indianapolis C5 New Castle, Pa. B4	7.15	9.10 8.95	10.50 10.50 10.50	12.65	15.3				
New Haven, Conn. D1 Pawtucket, R. L. N7 Pittsburgh S7	7.65	9.35	10.90 10.90 10.60	12.75	15.4				
Riverdale, Ill. Al Sharen, Pa. Sl Trenten R4	7.10	9.85	10.60	12.75	15.4				
Wallingford W1 Warren, Ohio T4 Weirton, W. Va. W3	7.00	8.93	10.90 10.50 10.50	13.05 12.65	15.3				
Worcoster, Mass. A5 Youngstown C5			10,90	13.05 12.65					

BOILER TUBES

S per 100 ft, carload	SI	10	Seam	loss	Elec. Weld			
lets, cut 10 to 24 ft. F.s.b. Mill	OD- In.	B.W. Ga.	H.R.	C.D.	H.R.	C.D.		
Babceck & Wilcox	2 21/2 3 31/4 4	13 12 12 12 11 10	43.22 49.90 58.26	50.31 58.10 67.83	29.93 40.31 46.55 54.34 72.17			
National Tube	2 21/2 3 31/2 4	12 12 11	43,22 49,90 58,26	50.31 58.19 67.83	29.93 40.31 46.55 54.34 72.17			
Pittsburgh Steel	2 21/4 3 31/4 4	13 12 12 11 10	43,22 49,90 58,26	50.31 58.10 67.83				

RAILS, TRACK SUPPLIES

F.e.b. Mi Cents Per Lb	Ne. 1 Std.	Light Rails	Jeint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer UI	4.725	5 65	5 895				
Se. Chicage R3. Ensley T2 Fairfield T2	4	0.00	0.000	8 05			
Ensley T2	4.725	5.65		0.00	*****		
Fairfield T2		5.65		8.05	*****	5.625	*****
SARRY C//	14.725					15 625	
Ind. Harbor 13	14 790	1	E 895	20 9		E 496	
Ind. Harbor Y/ Johnstown B3. Joliet U/	1			8.05		-	
Johnstown B3.		5.65					
Jeliet UI			5.825				
LECKEWEIDS ().	214-722	ND. 83	ND. 8Z2	1		15. WZ3	1
Lebanon B3 Minnequa C6							12.15
Minnequa Co	4.725	6.15	5. 825	7.90		5.625	12.15
Pittsburgh 0/.					11.96		12.15
Pittsburgh P5.							12.15
Pittsburgh /3.				8.05			1
Seattle B2				8.40		5.775	12.65
Seattle B2 Steelten B3	4.72	5	5.82	5		5.62	
Struthers Y/				. 8. 95			
Tarrance C7	1		1	1		6 771	5
Williamsport S Youngstown R3	5	. 5.6	5				
Toungstown R3				. 18. 05			

COKE

Furnace, beehive (f.o.b. oven) Net-Ton Connellsville, Pa
Foundry, beehive (f.o.b. oven)
\$17.00 to \$18.00
Foundry, oven coke
Buffalo, del'd\$28.75
Chicago, f.o.b 27.00
Detroit, f.o.b
New England, del'd 28.55
Seaboard, N. J., f.o.b 26.75
Dhiladalphia dah
Philadelphia, f.o.b 26.50
Swedeland, Pa., f.o.b 26.50
Painesville, Ohio, f.o.b 27.50
Erie, Pa., f.o.b 27.50
Cleveland, del'd 29.43
Cincinnati, del'd 28.59
St. Paul, f.o.b
St. Louis, f.o.b 28.50
Birmingham, f.o.b
Lone Star, Tex., f.o.b 19.50

ELECTRODES

Cents per lb f.o.b. plant, threaded, with nipples, unboxed.

G	RAPHITE		CARBON*				
Diam. (In.)	Length (In.)			Length (In.)	Price		
24 20 16 to 18 14 12 10 7 5 4 3 2 ¹ / ₂	84 72 72 72 72 72 72 60 60 40 40 40 30 24	23.00 22.25 22.50 23.00 23.50 24.75 24.50 27.25 30.25 32.00 33.75 52.50	40 35 30 24 20 17 14 12 10 8	100, 110 116 118 72 to 84 90 72 72 72 80 60 60	9.90 9.90 10.05 10.30 10.10 10.35 10.85 11.75 11.80 12.10		

* Prices shown cover carbon nipples.

ELECTROPLATING SUPPLIES

Anodes	
(Cents per lb, frt allowed in quant	ity)
Copper	
Cast elliptical, 18 in. or longer,	
5000 lb lots	62.92
Electrodeposited	50.28
Brass, 80-20, ball anodes, 2000 lb	
or more	60.00
Zinc, ball anodes, 2000 lb lots	21.25
(for elliptical add 2¢ per lb)	
Nickel, 99 pct plus, rolled carbon	90.50
(rolled depolarized add 3¢ per lb	
Cadmium	\$1.70
Tin, ball anodes and elliptical.\$1.06 to	\$1.10
Chemicals	

(Cents per lb, f.o.b. shipping Copper cyanide, 100 lb drum Copper sulphate, 5 or more 100	80.50
bags, per cwt	
Nickel salts, single, 4-100 lb bags	38.21
Nickel chloride, freight allow	ed, 46.50
Sodium cyanide, domestic, f.o.b.	
N. Y., 200 lb drums (Philadelphia price 22.60	22.3
Zinc cyanide, 100 to 900 lb	55.5
Potassium cyanide, 100 lb dr	
N. Y	48.0
Chromic acid, flake type, 1 to 100 lb drums	

(Base discount, f.o.b. mill)

Machine and Carriage Bolt		
ca	se 20	unts ill case ,000 lb r more
½ in. & smaller x 6 in. & shorter	61	63
Larger than ¼ in. diam. and all diam. longer than 6 in. Rolled thread carriage bolts	55	57
½ in. & smaller x 6 in. and shorter Lag, all diam, x 6 in. &	61	63
shorter Lag, all diam. longer than	61	63
6 in	55 61	57 63
Nuts, Hex, HP, reg. & hvy.		
%" or smaller	64 63 65 61	66 65 67 63
C.P. Hex, regular & hvy.		
%" or smaller	64 61	63
Hot Galv. Nuts (all types)		
1½" or smaller	44	47
Finished, Semi-finished, Her		5
%" and smaller	66 63	66
Rivets		
3/ In and lavers	ase pe	r 100 II

								Ba	86	per	- 1	00 IP
1/2	in.	and	larger	*	*	. *	×		p	et i		19.95 List
7/1	6 ir	ane	smaller								. 11	32

Cap Screws

* * * * * * * * * * * * * * * * * * * *	Di	scount
		H.C. Hee
Bright Treat	ted	
New std. hex head, pack- aged		
%" thru %" diam. x 6"		
and shorter	34	20
9/16" and %" x 6" and		
smaller and shorter	31	16
%", %", 1" x 6" and		
shorter	9	+11
1/4" thru 1/4" diam. x 6"		
and shorter	49	41
9/16" and %" diam. x 6"		
and shorter	48	39
%", %", 1" x 6" and		
shorter	31	20
*Minimum quantity per	item	:
15,000 pieces %", 5/16", %	" dia	m.
5,000 pieces 7/16", 1/4", 9/1	16", 5	" diam.
15,000 pieces 4", 5/16", % 5,000 pieces 7/16", 4", 9/1 2,000 pieces %", %", 1" die	am.	

Machine Screws & Stove Bolts

			Disc	ount
Packaged, Bulk, bulk	package list	list	Mach. Screws 27	Stove Bolts 38
	Que	antity		
¼-in. diam. & under	25,000	-200,000	20	61
5/16-in. diam. & larger	} 15,000	-100,000	20	61
All diam. over 3 in. long	\$ 5,000	-100,000	-	61

Machine Screw & Stove Bolt Nuts

			Die	count
Packaged, Bulk, bulk		list	Hex 24	Square 27
P/ 1-		uantity		
% -in. diam. &	25,000	-200,000	18	20

BOLTS, NUTS, RIVETS, SCREWS CAST IRON WATER PIPE INDEX

Birmin														
New !	York													131.4
Chicas	. 03													133.4
San F	ranc	isco	J-L	. 1	1									140.2
Dec	. 19	5.5	va	244	8.	C	la	88		B	0	r	h	eavier
6 in. e	or la	rge	r.	be.	ll	al	ad	8	pi	go	ŧ	pi	pe.	Ex-
planat	ion:	p.	5	7.	80	p	t.	1	4	881				
U. 8.	Pipe	an	di	P 01	416	di	"M	C	0.					

REFRACTORIES

Fire Clay Brick	Carloads p	er 1000
First quality, Ill., Ky. (except Salina, Pa.	, Md., Mo., Oh	io, Pa. \$128.00
No. 1 Ohio		128.00
Sec. quality, Pa., Md.,	Ky., Mo., Ill.,	114.00
No. 2 Ohio		98.00
Ground fire clay, ne		
(except Salina, Pa.	. add \$2.00)	20.00

Silica Brick

Mt. Union, Pa., Ensley, Ala\$1	40.00
Childs, Hays, Pa	45.00
Chicago District	150.00
Western Utah144.00-	65.00
California	170.00
Super Duty	
Hays, Pa., Athens, Tex., Wind-	
ham, Warren, O., Morrisville	
150.00-	157.00
Silica cement, net ton, bulk, Latrobe	26.50
Silica cement, net ton, bulk, Chi-	a0.00
	24.00
cago	a4.00
Silica cement, net tons, bulk, Ens-	25.50
ley, Ala.	25.50
Silica cement, net ton, bulk, Mt.	
Union	23.00
Silica cement, net ton, bulk, Utah	
and Calif.	35.00

Chrome Brick	Per net ton
Standard chemically bonded, Standards chemically bonded,	Balt \$98.00
iner, Calif	108.00

Magnesite Brick

Standard	Baltimore					. 1	\$121.00
Chemicall	y bonded,	Balt	imo	re	. 4		109.00

Grain	n Ma	gn	05	H	e		8	51		9	6	ŧ	0	3	6	-	n.	grains	
Dome	estic,	f.c	.b		B	a	lti	n	a	la	e	1	n	b	a	al.	k.	\$69.40	
in	bulk sacks																	43.00 49.00	

Dead	Burned	Dolomi	te	Per	net	ton
F.o.b.	bulk, p	roducing	points	in:		
Pa.,	W. Va.	, Ohio			. \$1	15.00
Mid	west					15.6
Min	nonel Ve	How			- 1	14.0

METAL POWDERS

Per pound, f.o.b. shipping point, lots, for minus 100 mesh	in ton
Swedish sponge iron f.o.b. Riverton, N. J., ocean bags	8.50€
Canadian sponge iron,	
Del'd in East, carloads	9.5¢
Domestic sponge Iron, 98+%	8.5€
Fe, carload lots	0.05
Electrolytic iron, annealed,	27.5€
imported 39.5+% Fe	
domestic 99.5+% Fe	36.5€
Electronytic non, unumbered	FR 04
minus 325 mesh, 99+% Fe	57.04
Electrolytic iron melting	
stock, 99.84% pure Carbonyl iron size 5 to 10	22.0∉
Carbonyl iron size 5 to 10	
micron, 98%, 00.8+% Fe \$6.04	to \$1.55
Aluminum freight allowed	38.00∉
Brass, 10 ton lots37.50¢	to 50.00¢
Copper, electrolytic	59.50€
Copper, reduced	59.50€
Cadmium, 100-199 lb, 95¢ plus met	al value
Chromium, electrolytic 99.85%	
Chromium, electrolytic 99.85% min. Fo .03 max. Del'd	\$5.00
Lead	tal value
Manganese	70.0€
Molybdenum, 99% \$3.06	to \$3.25
Nickel, unannealed	\$1.00
Nickel, annealed	\$1.06
Midral enhanced mannaged	
#80 Silicon	\$1.13
CID com	43.504
Solder powder7.0¢ to 9.0¢ plus m	ot value
Stainless steel, 302 Stainless steel, 316	\$1.32
Stainless steel, 510	401 101110
Tin14.00¢ plus me	THE VALUE
Tungsten, 99% (65 mesh) Zinc, 10 ton lots18.75¢	44.50
Zinc, 10 ton lots18.75¢	to 32.50#

Ferroalloy Prices

(Effective Aug. 7, 1956)			
Ferrochrome Contract prices, cents per lb contained Cr. lump, bulk carloads, del'd, 67-71% Cr. 30-1.00% max. Sl. 0.20% C 36.25	Spiegeleisen Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa. Manganese Silcon 16 to 19% 35 max	Alaifer, 20% Al, 40% Si, 40% Fe, Contract basis, f.o.b. Suspen- sion Bridge, N. Y., per lb. Carloads Ton lots	10.65¢ 11.80¢
Cr. 1ump, bulk carloads, del'd, 67-71%, Cr., 30-1.00 % max. 81. 0.02% C 36.25 0.30% C 36.25 0.30% C 36.00 0.06% C 37.25 1.00% C 35.25 0.10% C 35.10 0.15% C 36.75 1.50% C 35.10 0.15% C 36.75 1.50% C 35.10 0.15% C 36.50 2.00% C 35.00 4.00-4.50% C, 67.70% Cr. 1-2% Si. 26.25 3.50-5.00% C, 57-64% Cr. 2.00-4.50% 25.00	19 to 21% 3% max 94.00 21 to 23% 3% max 96.50	f.o.b Langeloth, Pa., per pound Contained Mo	\$1.84
0.15% C 35.50 2.00% C 35.00 4.00-4.50% C, 67.70% Cr, 1-2% Si 26.25 3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si	Manganese Metal Contract basis, 2 in. x down, cents per	Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.	
Si 25.00 0.025% C (Simplex) 32.50 0.10% C, 50-52% Cr, 2% max Si 33.75 8.50% max C, 50-55% Cr, 3-6% Si 22.50 8.50% C, 50-55% Cr, 3% max Si 22.50	pound of metal, delivered. 95.50% min. Mn, 0.2% max. C, 1% max. St, 2.5% max. Fe. Carload, packed	Ton lots Less ton lots Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract	\$6.90 6.95
High Nitrogen Ferrochrome Low-carbon type 0.75% N. Add 5¢ per	Electrolytic Manganese	basis, del'd, ton lots, 2-in. X D per lb con't Sb plus Ta Ferromolybdenum, 55-75%, 200-lb	\$4.66
Low-carbon type 0.75% N. Add 5¢ per ib to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% of N.	F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.	Pa., per pound contained Mo	\$1.54
Chromium Metal Contract prices, per 1b chromium con-	Carloads 31.5 Ton lots 33.5 250 to 1999 lb 35.5 Premium for hydrogen-removed		\$90.00
Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr. 1% max. Fe. 0.10% max. C 1.27 0.50% max. C	Medium Carbon Ferromanganese	Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville,	110.00
Electrolytic Chromium Metal	Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn 22.86	per lb contained Ti	\$1.88
plate (%" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max. Carloads	Low-Carb Ferromanganese Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.	0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti Less ton lots.	\$1.50 \$1.55
Lew Carbon Ferrochrome Silicon	Carloads Ton Less 0.07% max. C, 0.06% P, 90% Mn 34.00 36.55 37.75 0.07% max. C 31.95 34.50 35.70	Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, car-	
(Cr 34-41%, Sl 42-45%, C 0.05% max.) Contract price, carloads, delivered, lump, 3-in. x down, per lb of Cr, packed. Carloads	0.07% max. C, 0.06% P, 90% Mn 34.00 26.55 27.75 0.07% max. C 31.95 34.50 35.70 0.10% max. C 31.20 33.75 34.95 0.15% max. C 30.45 25.00 34.20 0.30% max. C 28.45 31.00 32.20 0.50% max. C 28.45 31.00 32.20 0.75% max. C, 80.85% Mn, 5.0-7.0% S1 25.45 28.00 29.20	load, per net ton	
Less ton lots 48.55	0.75% max. C, 80.85% Mn, 5.0-7.0% Si 25.45 28.00 29.20	W, ton lots, delivered Molybdic exide, briquets, per lb contained Mo, f.o.b. Langeloth,	\$3.45
Contract price per lb of alloy, lump,	Silicomanganese	Pa	\$1.32
delivered, packed. 30-33% Cr. 60-65% Si, 3.00 max. Fe. Carloads 23.00 Ton lots 26.75 Less ton lots 28.25	Contract basis, lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point. 12-00 Carload bulk 12-00	Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb.	17.50#
Colcium-Manganese—Silicon Contract prices, cents per lb of alloy, lump, delivered, packed. 16.20, Ca. 14.15, Mp. 52.50, Si	Ton lots 13.45 Briquet contract basis carloads, bulk, delivered, per lb of briquet 13.55 Ton lots, packed 15.76	Ton lots, packed lump	20.004
lump, delivered, packed. 16-20% Ca, 14-18% Mn, 53-59% Sl. Carloads 23.05 Ton lots 24.95 Less ton lots 25.96	Silvery iron (electric furnace) Sil 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$100.00 gross ton, freight allowed to normal trade area.	tained V ₂ O ₅ . Zirconium contract basis, per 1b of alloy 35-40% f.o.b. freight allowed,	\$1.38 26.25¢
Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr. 20% Fe ½ in. x 12 mesh.	Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$93.00.	carloads, packed	8.50
20% Fe ½ in. x 12 mesh. Ton lots	Silicon Metal Contract price, cents per pound con-	Boron Agents Boronii, contract prices per lb of	
V Foundry Alloy	tained Si, lump size, delivered, packed. Ton lots Carloads 96.50% Si, 2% Fe 22.75 21.45 98% Si, 1% Fe 23.25 21.95	alloy del. f.o.b. Philo, Ohio, freight allowed, B 3.14%, Si 40-45%, per lb contained 2	\$5.26
Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42%, Cr, 17-19%, St, 8-11% Mn, packed. Carload lots	Silicon Briquets	Bortam, f.o.b. Niagara Falls Ton lots, per pound Less ton lots, per pound	45¢
Less ton lots	Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si. briquets.	Cerbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5%	
Cents per pound of alloy, f.o.b. Sus-	Carloads, bulk	f.o.b. Suspension Bridge, N. Y., freight allowed Ton lots per pound	14.00¢
Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11% Ca 5 to 7%. Carload packed	Contract price, cents per ib contained	Ferroboron, 17.50% min. B, 1.50% max. S1, 0.50% max. A1, 0.50% max. C, 1 in. x D, ton lots F.o.b. Wash., Pa.; Niagara Falls,	1.20
Ton lots to carload packed 19.65 Less ton lots	St, lump, bluk, carloads, f.o.b. shipping point. 50% Si 12.75 75% Si 15.46 65% Si 14.50 85% Si 17.10	F.o.b. Wash., Pa.; Niagara Falls, N. Y., delivered 100 lb up 10 to 14% B	.85
Ferromanganese Maximum contract base price, f.o.b., lump sise, base content 74 to 76 pct Mn.	90% St 18.50	Grainal, f.o.b. Bridgeville, Pa.,	1.50
Producing Point Centa per-lb Marietta, Ashtabuia, O.: Alloy, W. Va.; Sheffield, Ala.; Portiand, Ore	Eastern zone contract prices, cents per pound of metal, delivered. Cast Turnings Distilled Ton lots \$2.05 \$3.75	freight allowed, 100 lb and over No. 1 No. 79 Manganese - Boron, 75.00% Mn., 15.20% R 54, may Fe 156.	\$1.05 50¢
Ore. 10.75 Johnstown, Pa. 10.75 Sheridan, Pa. 10.75 Philo, Ohio 10.75 S. Duquesne 10.75 Add or substract 0.1¢ for each 1 pet Mn	Less ton lots. 2.40 3.30 4.55 Ferrovanadium	15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D. del'd. Ton lots	\$1.46
Briquets, delivered, 66 pct Mn:	50-55% V contract, basis, delivered, per pound, contained V, carloads, packed. Openhearth	Mekel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50%	1.57
Carloads, bulk	Crucible	max. C, 3.00% max. Fe, balance Ni, del'd less ton lots	\$2.06

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THE CLEARING HOUSE

News of Used and Rebuilt Machinery

Wanted: More Machines . . . West Coast dealers, from the Canadian to Mexican borders, all agree that business is great and would be greater if they had more machines to sell.

Their customers are paying near-new prices for some equipment. But it must be in good condition and not older than six years. Most needed: lathes, turret lathes, drill presses.

Dealers are scrounging around Eastern and Midwestern markets. "You can find what you want if you dig hard," one dealer reports. "Meanwhile, we're getting a little help from Uncle Sam. He's been kicking some stuff loose recently."

Expansion's Behind It . . . Behind all the hustle is the tremendous expansion of Farwestern industry. New and growing plants can't get good deliveries on new machinery. They want to get production rolling, so they're pushed into the used machinery market.

In Los Angeles, sheet metal equipment is especially hot. Steady business comes from aircraft builders and home-building-industry suppliers. And there's considerable new demand from electronics manufacturers. Their huge industry—a new plant a week since 1947—is booming along. (See West Coast Report, p. 59). And they gobble up big quantities of sheet metal equipment.

Electronics is a big factor in the Farwest with 531 manufacturers making 172 products. These concerns employ about 72,00 people.

Slack at the Bay... A summermonths slackening of San Francisco Bay area business is only temporary. It's offset by the volume enjoyed so far this year. Some dealers attribute the letdown to the recent steel strike, or work stoppages in other machinery-using industries. One dealer sees it this way: "The big boys still are going ahead with their machinery buying program but the little guys are getting a bit reluctant."

Nevertheless, he added, business has not dropped off sharply. As things stack up at present, his firm now is running about 20 pct ahead of last year for the first half of 1956.

Quality Counts . . . Dealers report they still find quality merchandise moving the best. Good reconditioned stuff, under 10 years, brings top prices—about 70 pct of equivalent new machinery.

Another dealer, who stresses that customers insist on post-war merchandise, says buyers are tired of equipment that "dollars-you-to-death" with constant minor repairs that result in expensive downtime.

"Prospects now want to see the piece of used equipment they are interested in. They want to watch it run and make sure it's in good shape. Under - the - counter deals, with purchases made sight unseen, are out," he reports.

Looking Afield . . . Dealers unable to supply demand from local sources say they are buying mostly in Chicago, Cincinnati, Detroit, and Indianapolis.

Best movers: engine lathes, radial drills, milling machines, and horizontal boring mills. Sheet metal and plate working equipment are also moving well.

Machinists' strike in the Bay Area put a temporary crimp in tools needed by this trade.

One dealer, who boasts of a 200 to 300 pct sales increase so far this year, feels used machinery prices will be going up now that the steel strike is settled. Some others say prices will stay put.

At present, prices are holding firm. Deliveries are running about 30 days compared with six months on new equipment.

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6' x 3/6' Ningara, Initial Type

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BRAKES—LEAF TYPE

BY 216 Ga. Irvie & Krupe Model BRAKES—LEAF TYPE

10'x16 Ga. Dreis & Krump Hand Operated

12'x %" Dreis & Krump

12'x %" Dreis & Krump, Motor Driven

BRAKES—PRESS TYPE

10'x %" Superior Hydraulic NEW

10' x \(\frac{1}{3} \) Superior Hydraulte NEW

GRANES—OVERHEAD ELECTRIC TRAVELING

GRANES—OVERHEAD ELECTRIC TRAVELING

1 ton P&H

15' Span 320 Volt D.C.

5 ton Shepard Niles

45' Span 220 Volt D.C.

10 ton Cyclops

40' Span 220 Volt D.C.

10 ton P&H

10 ton

22 ton L-B 00 ft. Runway
120 ton L-B 00 ft. Runway
120 ton L-B 00 ft. Runway
80 Span 220/3/60 A.C.
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HAMMERS BOARD OROP—STEAM DROP
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LATHE—TURRET
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72 McKay 17 Rolls 44, Dia.
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No. 35 U. 8. Multi Slide Machine

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PRESSES—HYDRAULIC
500 ton Clearing H-1500-40, 24" Stroke, Bed 36x42"
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800 ton Clearing, 48" Stroke, Bed 48x48"
1000 ton Lake Erle Dible Acting, 66" Strokes, Bed
Area & Platen 72" x 146 The Strokes
PRESS—578 RAIGHT 81DE
Clearing Model TF41500-200 Triple Acting Strokes Clearing Model TF41500-200 Triple 40, 32, 14". Bed Area 100" x 20 PUNCH & SHEAR COMBINATIONS

PUNCH & SHEAR COMSINATIONS
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Pels LUSEFF, Funch 1½" x 1". Shear Angles 6 x
6 x ½", fld. 2½", 80, 25", etc.

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10 x 16" Flind, Single Stand, Two High
12" x 20" Shind, Single Stand, Two High
15" x 20" G & M Single Stand, Two High
15" x 20" G & M Single Stand, Two High
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114" Williams

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6 x 6 x %" Clevela 10' x %" Cincinnati, LATE 12' x 3/16" Niagara SL-12 12' x 5/5" Steelweld LATE 14' x 5/5" Dreis & Krump SLITTERS

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36" Yoder Slitting Line
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STRAIGHTENERS 2 Roll Rotary Straightener, M.D.

ane & Roach 2 Roll Rotary Straightener, M.D. Capacity Mildsteel %" to %" ane & Roach 5 Roll #5250-B. Capacity %" to 2%" solld, 4%" Tube

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60,000, 100,000, 200 and

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1943. No. 74 Heald hyd, pl. internal, X-silding H. S., 1941. 12" x 24" Cincinnati ER hyd. universal syl. serial 20381H-5. 14" x 38 Landin type C hyd. pl. evilodolani 2U3BIH-5. " x 36 Landis type C hyd. pl. eylindrical, 1942. | x 30" Cincinnati EA Filmatic pl. cylindrical, 1942.

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No. 6-1 Nazel, pneumatic late.
No. 5N Nazel, self-contained.
No. 6B Nazel, self-contained.

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14" x 8" Hendey Toolroom, 1940.
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39HU35.
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1	500	Ch. Wh.	720	575/600	2309/440
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Qu.	H.P.	Make	Туре	Volta	R.P.M.
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3	600	Whae.	Mill	220	110/220
3	500	Whae.	Mill	250	285/710
1	450	Whse.	BE	230	450/600
1	350	G.E.	CD-169	230	1150
1	300	Whse.	Mill	230	425/850
9	275	Whae.	Ped. Brg.		400/1200
1	200/250	What.	8K-210	230	400/800
A	180	G.E.	MPC	230	400
1	150	Whee.	BK-201	230	309/900
9	125	Whee.	SK-184	239	575/830
ĩ	125	G.E.	MPC	230	400/600
î	100	El. Dy.	80-8	230	450/1350
2	100	El. Dy.	30-8	230	475/950
1	80	Reliance	651-T	230	575/1150
1	60/80	El. Dy.	25S	230	525/1150
1	40	G.E.	CD-123	230	500/1000
1	40	Whae.	8K-140	230	500/1700
1	321/2	Whee.	8K-150	230	400/1200
3	25	Whse.	8K-93	230	1300 1150/2400
	20	Cr. Wh.	D.P.B.B. 8K-123	230	400/1200
1 1 8	15	G.E.	CD-85	230	575/2300
1 4	15	Whse.	8K-100L	230	500/1500
	15	Reliance	155-T	230	400/1600
î	10	Whse.	8K-103	230	400/1600
l î	10	Al. Ch.	E-122	230	300/1200
1 1 4 1 1 4	10	Whse.	BK-91	230	250/1000
i	714	G.E.	CD-75	230	690/2070
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1-3500 HP GEAR DRIVE, ratio 6.45 to 1.

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1	1000	A.C.	Mill	2300	240
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1	700	G.E. A.C.	MIT-578	2300	500
1	500	Whee.	CW	550	850
1	400	Whee,	CW-960A	440	1170 514
î	400	Whae,	CW-1213	2200	485
1	350	G.E.	IM-17A	440/2200	720
1	250 250	G.E.	MT-424Y MT-550R	4000 2200	257
i	250	Al. Ch.	W.L2560	550	600
1	200	Cr. Wh.	20QB	440	505
1	200	G.E.	IM	2200	435 580
1	200 150 (name	G.E.	CW	2300	435
- 8	125	A.C.	0	440	865
1	125	A1. Ch.		440	720
1	100	G.E.	IM-16 IM	2200	435
4	100	A.C.	ANT	440	695
-		SQUIR	REL CAGE		
1	808	G.E.	KT-578	2200	1180
2	650 450	G.E.	FT-550BY C8-1420	440	3570 354
2 1 1 1 3 1	400	G.E.	TE-15B	2200	1165
1	400	G.E.	IN	2200	500
1	200	G.E.	IK-17 KT-587	440	580 1800
1	150/75	G.E.	IK 1-201		00/450
1	150	Whise,	CS-856B	440	880
1 2	150	Whie.	CS ARW	449 2200	580 1750
2	125	Al. Ch.	HRONOUS		1750
Qu.	H.P.		Туре	Volta	RPM
1	7000	G.B.	ATT	2200/6600	680
1	4356 2858	C.W. Whee.		2300/4600	00 514 514
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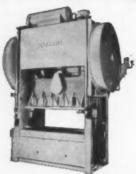
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Write for Bulletin SUT Start Rough Bulletin SUT Start Rough Ros. TOOL CO. Start Rough Ros. TOOL CO. Start Rough Ros. Chicago 30, U.S.A.



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From the newest developments in metalworking equipment featured

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more and more manufacturers are saying: "Let's use

COLD ROLLED STRIP STEEL

Made to your specifications in all thick-nesses from .012 to .375 inches and widths from ½" to 19" depending upon gauge.

NARROW ROLLED ROUND

CENTRAL STEEL & WIRE CO.
Detroit, Chicago, Cincinnati
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New York City

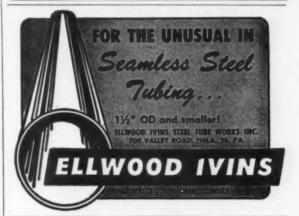
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You really get your money's worth when you buy precision screw machine products made by "you know W.H.O.*"

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FORGINGS

ALL SIZES, pressed . . rolled . . extruded . . forged to accurate specifications from carbon, alloy, stainless steels und special metals. Modern metallurgical, die, heat-treating and rough machining facilities.

Over 50 years of forging design and development

THE CANTON DROP FORGING & MFG. CO. CANTON, OHIO



METALWORKING BRIEFS

The Steel Price Increase

U. S. Steel's average price increase of \$8.50 per ton, effective Aug. 7, was a great deal less than some people had expected, but in line with The Iron Age prediction of July 5 of "\$8 a ton—or more." Steel companies could have justified a higher increase, but chose to hold the boost to a minimum in line with anti-inflationary policies.

Strike Ends At TCI

After 98 days, the strike at the Tennessee Coal & Iron Div. of U. S. Steel Corp. ended this week. Plant was shut down originally April 27 when steel workers refused to cross picket lines set up by a striking railroad union. Steel workers officially struck on July 1. Walkout losses: \$39.2 million in wages; \$39.2 million to vendors who sell to company, 1.2 million ingot tons of steel. South will feel after-effects for months, perhaps years.

Jessop Steel Negotiates With Green River

Frank Rackley, president of Jessop Steel Co., says his company is negotiating for purchase of Green River Steel Corp., Owensboro, Ky. Although underway for some time, talks are said to be still in the preliminary stage. Jessop reportedly has other irons in the fire, too.

J. I. Case Closes Anniston Plant

J. I. Case Co., farm implement manufacturer, announces it is closing its Anniston, Ala., plant permanently. Depressed market conditions forced decision.

Wisconsin Furnace Producing

Wisconsin Steel Co. has put its third blast furnace into production following a shutdown during which hearth size was increased from 18 to 21.5 feet, raising capacity to 900 tons per day.

Fast-Tax Certificates

Republic Steel Corp. has been granted certificates of necessity covering titanium melting and processing facilities worth \$7.8 million. Iron Mines Co. of Venezuela, headquartered at Bethlehem, Pa., granted a certificate covering a \$4 million oceangoing ore carrier.

Kaiser Expansion Loan

Kaiser Steel Corp. is borrowing \$100 million in long-term money at $4\sqrt[3]{4}$ and 5 pct to help finance expansion of ingot capacity from 1.5 to 2.2 million tons and finished steel capacity from 1 to 1.5 million.

An asterisk beside the name of advertiser indicates that a booklet, or other information, is offered in the advertisement. Write to the manufacturer for your copies today.

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PRECISION AY IRON . ALLOY IRON . DUCTILE IRON CASTINGS CEMENT BONDED SAND METHOD CHAMBERSBURG ENGINEERING COMPANY THE HAMMER BUILDERS"

CASTINGS STAINLESS

Call Alloy Steel Casting Co. for heat and corrosion resistant stainless steel castings because:

- · Pattern shop with new method for making duplicate patterns without dimensional shrinkage at half the cost
- Complete heat treating facilities
- Early delivery on 2 oz. to 500 lb. stainless steel castings
- Experienced foundry engineers

Write now or call for complete information.



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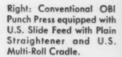
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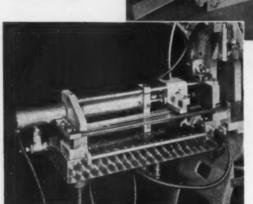
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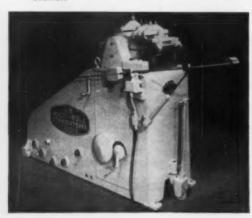
FOR THE PRESS ROOM

BUT THE PRESS





Above: U.S. Air Operated Slide Feed (no mechanical connections to the press), open side type, suitable for material up to 15" in width and feeding length adjustable up to a maximum of 12" at one stroke. Longer feed lengths obtainable by cycle feeding with counter.



Reduction of costs is a primary concern of all manufacturers. Units included in the line of U.S. Automatic Press Room Equipment such as U.S. Slide Feeds, Roll Feeds, Stock Reels, Coil Cradles, Stock Oilers and Wipers, Scrap Choppers, are designed and built with the aim of converting the punch press into an automatic machine. The end results are increased production, reduced scrap, reduced operator fatigue, reduced material handling and overall reduced costs.

If you use presses in your production program, write for our Bulletins 80-C and 95-C illustrating and describing U. S. Automatic Press Room Equipment.

Left: Model PDSC-940 U.S. Combination Coil Cradle and Power Driven Straightener suitable for material up to 9" in width and coils with O.D. up to 40", weight capacity 1,500 lbs.

U. S. TOOL COMPANY, Inc.

AMPERE (East Orange) NEW JERSEY

Builders of U. S. Multi-Slides — U. S. Multi-Millers — U. S. Automatic Press Room Equipment—U. S. Die Sets and Accessories

Pangborn
Rotoblast
Cuts
Cuts
Cleaning
Costs \$250
a Day for
General
Foundries!



Some foundrymen tell us they're most impressed with Pangborn Rotoblast's speed of cleaning, its high production rate. Others praise the quality of its work . . . the manpower reduction due to its automatic operation. But whatever the reasons—cleaning quality, speed, lower labor and maintenance costs, no abrasive loss—they all add up to the fact that Pangborn Rotoblast gives you lower cost per ton of castings cleaned. And, in the final analysis, this figure determines the efficiency of your blast cleaning operation.

Investigate Pangborn Rotoblast and discover which machine can best streamline your operating costs! Write for Bulletin 227 to PANGBORN CORPORATION, 1500 Pangborn Blvd., Hagerstown, Maryland. Manufacturers of Blast Cleaning and Dust Control Equipment.

And \$1,500 a month for Specialty Aluminum and Bronze!

costs and eliminating casting breakage to the tune of \$250 a day!

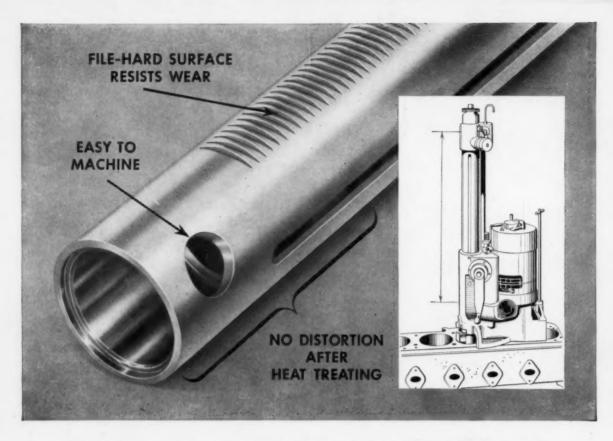


At Specialty Aluminum and Bronze Corp., Revere, Mass., the Pangborn Blastmaster Barrel reveals any casting imperfection as soon as blasted. This saves further processing costs. This and other savings total \$1,500 a month for the firm!

Panaborn
BLAST CLEANS CHEAPER

Control the Control Day Front Control Day

Control the Control Da



Boring bar maker solves heat-treat distortion problem by switching to TIMKEN® 52100 steel

HEAT-TREATING distortion was running up the manufacturing costs of the boring bars Van Norman Automotive Equipment Company makes for reboring hardsleeve cylinder blocks. The column of the boring bar, which acts as the spindle, had to be extremely straight. Yet many of them were distorting after heat treatment. And that meant putting them through an extra straightening process.

Studying the problem, metallurgists of the Timken Company suggested a switch to Timken® 52100 steel. Since this steel is hard and tough, it had the qualities Van Norman wanted. And because it responds uniformly to heat treatment it proved to be the answer to their production problem.

By switching to Timken 52100 steel, Van Norman eliminated the need for the costly straightening operation. And as a bonus, they've found that Timken 52100 steel is easier to machine than the steel they previously used.

The Timken Company pioneered the development of 52100 and is one of the principal producers of the steel—the only source of the grade in three finished forms: bars, tubing and wire. You can rely on the Timken Company for small run or emergency requirements as well as mill quantities.

We stock 101 sizes of 52100 steel, ranging from 1" to 10½" O.D. For a complete stock list of available sizes, grades and finishes, write The Timken Roller Bearing Company, Canton 6, Ohio. Cable: "TIMROSCO".



SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS STEEL TUBING